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PUBLIC LAND STUDY

THE FORAGE RESOURCE

FOR THE

PUBLIC LAND LAW REVIEW COMMISSION

by THE UNIVERSITY OF IDAHO
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THE FORAGE RESOURCE

A STUDY FOR THE

PUBLIC LAND LAW REVIEW COMMISSION

VOLUME 4

Chapter VI Legal

VII Resource

VIII Alternatives

UNIVERSITY OF IDAHO
Moscow, Idaho

PACIFIC CONSULTANTS, INC.
Moscow, Idaho

June 1969
(Revised January 1970)

STUDY OUTLINE

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GLOSSARY OF TERMS*

ADJUDICATION. The apportionment of grazing use on public range among eligible applicants.

ADJUSTMENTS. Changes in animal numbers, seasons of use, kinds or classes of animals, or management practices as warranted by specific conditions.

ALLOTMENT. An area designated for the use of a prescribed number of cattle or sheep, or by common use of both under one plan of management.

ALLOTMENT MANAGEMENT PLAN. A written action program designed cooperatively by the livestock operator and the Government to reach specific management goals of both parties. Components of the AMP are: (1) statement of forage resources, (2) objectives of livestock management, (3) grazing management system, (4) proposed range improvement practices, and evaluation effectiveness of grazing system.

ANIMAL MONTH. A month's tenure upon range by one animal.

ANIMAL UNIT. A standardized unit of measurement for range livestock which is equivalent to one cow or five sheep or five goats, all over six months of age.

ANIMAL UNIT MONTH. The amount of feed or forage required by an animal unit for one month. Not synonymous with animal month. Abbr., AUM.

ANNUAL LICENSE OR PERMIT. A document which limits the total authorized grazing period to one year or less. It may or may not be subject to renewal.

BASE PROPERTY. See "commensurate property."

CLASS I PROPERTY. Land dependent by use, or full-time prior water.

CLASS II PROPERTY. Land dependent by location, or full-time water.

COMMENSURABILITY. Capacity of a permittee's base ranch property to support permitted livestock during the period such livestock are off public land.

COMMENSURATE PROPERTY. Land or controlled livestock water which qualifies a person for a grazing preference on other land, either public or private. Syn., "base property."

COMMON USE. The use of range by more than one kind of animal either at the same time or at different times within the same growing season.

COMMUNITY ALLOTMENT. An allotment upon which several permittees graze in common.

COW-CALF OPERATIONS. Breeding cows are kept and comprise most of the herd. In its extreme form, weaned calves at about six to eight months of age are sold, only enough heifer calves being retained to replace death loss of mature cows. The emphasis is on the production of growing animals, not upon readying them for market.

DEPENDENT PROPERTY. See "commensurate property."

ELEVEN WESTERN STATES. Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Washington, Oregon and California.

FORAGE. (N) All browse and herbaceous food that is available to livestock or game animals. It may either be used for grazing or harvested for feeding. (V) Act of consuming forage.

FORB. Broad leafed herbaceous plant.

GRASS AND GRASSLIKE. Narrow leafed herbaceous plants of the grass and selge families.

GRAZING. Consumption of range or artificial pasture forage by animals.

GRAZING DISTRICT. An administrative unit of federal range established by the Secretary of the Interior under the Taylor Grazing Act of 1934, as amended.

HERB. A non-woody plant, at least above the ground.

HERBACEOUS. Of the texture of a herb; not woody.

LIVESTOCK FARM. Farms that raise cattle (non-dairy), calves, hogs, sheep, goats, wool, and mohair that do not qualify as livestock ranches.

LIVESTOCK RANCHES. Ranches in which the sales of livestock, wool, and mohair represent 50 percent or more of the total value of farm products sold and in which the pastureland or grazing land amounts to 100 or more acres and is ten or more times the acreage of cropland harvested.

MULTIPLE USE. The management of all the various renewable surface resources of the public lands so that they are utilized in the combination that will best meet the needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; that some land will be used for less than all of the resources, each with the other, without impairment of the productivity of the land, with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output.

NON-USE. Lack of the exercise, temporarily, of a grazing privilege on grazing lands. Also, an authorization to refrain, temporarily, from placing livestock on public ranges without loss of preference for future consideration.

PARALLEL LANDS. Uncultivated lands which produce the same general types of forage and which are physically similar to the surrounding federal range. Generally grazed at the same time as the federal range.

PRIOR USE. Grazing use preceding a specified time. General reference is to 5-year period immediately preceding June 28, 1934.

PRIVILEGE. A particular and peculiar benefit or advantage enjoyed by a person, company, or class, beyond the common advantages of other citizens. General reference is to privilege to graze on public lands which may be created by permit, license, lease or agreement.

RANGE. All land producing native forage for animal consumption, and lands that are revegetated naturally or artificially to provide a forage cover that is managed like native vegetation.

RANGE IMPROVEMENT PRACTICE. Artificial seeding, fencing, fertilizing, control of undesirable plants, construction of water spreaders, stock water developments, flood control devices. Also, used to mean management changes of grazing use both in period of use and numbers of use, more common change is reduction in numbers of use.

STEER OR STOCKER RANCHES. Growing cattle are purchased from another rancher, grazed for at least one season and possibly longer, and sold. Though called steer ranches because steers are the most common class of cattle bought, heifers and even mature cows are often included. No breeding herd is kept.

TEMPORARY LICENSE OR PERMIT. A document authorizing grazing a certain number of animals on public lands during an emergency or for a certain period, terminable at the end of such period.

TERM PERMIT. A document authorizing grazing a certain number of animals on public land for a specific term up to 10 years in the U.S. Forest Service and Bureau of Land Management.

WATERSHED. A drainage area.

* Source: "A Glossary of Terms Used in Range Management," American Society of Range Management; M. Clawson, Western Range Livestock Industry (1950); Public Land Statistics, 1967.

CHAPTER VI - APPENDIX - LEGAL

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SECTION A

ADMINISTRATION OF FORAGE RESOURCES ON STATE LANDS

Montana State Land

The total area of Montana is 94,168,320 acres, of which 93,271,040 acres are land, 1/ 27,638,884.4 acres are public land under ownership of the federal government, 2/ and 5,347,770.79 acres are state lands under ownership of the state of Montana. 3/

Montana, by constitution and statute, requires that the state land be classified by the Board of Land Commissioners as: (1) lands which are valuable only for grazing purposes; (2) lands which are principally valuable for timber that is on them; (3) agricultural lands; and (4) lands within the limits of any town or city or within three miles of such limits. 4/ The statutes and regulations refer to the Board of Land Commissioners in varied terms; however, this report will use the term Board.

The Board has classified 4,181,136.42 acres of state land as grazing lands. Jurisdiction over these lands is placed with the Board. 5/ In substantial part this represents the total state grazing lands; however, a relatively small portion of the timber lands which are under the jurisdiction of the State Forester are subclassified as grazing. The total acreage of timber lands is 478,724.30, 6/ of which 32,432 acres are inventoried as "non-forest acres." 7/

Therefore, the primary responsibility for administration of grazing lands is given to the Board. The Board is a four-member board made up of the governor, the superintendent of public instruction, the secretary of state, and the attorney general. The chief administrative and executive officer under the Board in all matters except those

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1/ U.S. Bureau of Land Management, Department of the Interior, Public Land Statistics, 1967, p. 3.
2/ Id. at 11.
3/ Biennial Report for Period Beginning July 1, 1964, to June 30, 1966, Montana Department of State Lands and Investments, p. 8.
4/ Article XVII, Section 1, Repl. Vol. 1 (Part 1), Revised Codes of Montana, 1947; Section 81-302, Repl. Vol. 5, Revised Codes of Montana, 1947.
5/ Chapter 4, Title 81, Repl. Vol. 5, Revised Codes of Montana, 1947.
6/ Biennial Report for Period Beginning July 1, 1964, to June 30, 1966, Montana Department of State Lands and Investments, p. 8.
7/ Twentieth Report 1965-1966, Office of the State Forester, p. 17.

pertaining to the forests is the Commissioner of State Lands and Investments whose appointment is by the governor with consent of the senate.

Before setting forth the statutory and administrative provisions relating to grazing on Montana state lands, two observations must be made. Montana has not adopted a state administrative procedure act. The result is that the administrative regulations in nearly all cases are not published, but rather consist of unwritten policy as developed through the years. However, the legislature has set forth two statutes which contain legislative guidelines for the administration of grazing on state lands. The first of these two statutes is referred to as "Leasing of Agricultural Lands - Grazing Lands and City and Town Lots," 8/ hereinafter referred to as the State Leasing Act and governs the Board in its administration. The second is the "Grass Conservation Act," 9/ which applies to grazing districts but does not control the Board in regulating grazing on state lands.

The Board, acting through its executive officer, the Commissioner, follows the guidelines set forth in the State Leasing Act in administering grazing on public lands. By statute no person is qualified to lease state lands except one who is the head of a family or who has reached the age of 21 years. Any such person and any association, company, or corporation authorized to hold lands under lease may lease state lands. Lands in Montana are, therefore, allocated by lease rather than permit.

In allocating state lands for grazing, Montana has no preference provision. There are no base property or commensurability requirements, and no dependency by use or location classifications. The land is allocated by bid to the highest bidder. The only requirement is that the bid exceed the minimum value set by statute. The minimum value is computed by a base rental formula by:

> "... Multiplying thirty-two cents (32¢) plus two (2) times the average price per pound of beef cattle on the farm in Montana for the previous year times the animal unit month carrying capacity of the land.
>
> "(a) The minimum annual rental for grazing lands with an annual carrying capacity of more than fourteen (14) and less than twenty (20) animal units per section is the base rental.
>
> "(b) The minimum annual rental for grazing lands with an annual carrying capacity of more than nineteen (19) animal units per section is ten cents (10¢) more than the base rental.
>
> "(c) The minimum annual rental for grazing lands with an annual carrying capacity of less than fifteen (15) animal units per section is ten cents (10¢) less than the base rental.
>
> "The carrying capacity of the land, to be used in the above formula, shall be in accordance with the determinations of the Commissioner of State Lands and Investments made pursuant to section 81-404, R.C.M. 1947.
>
> "The average price per pound of beef cattle on the farm in Montana shall be taken from statistics published by the Bureau of Agricultural Economics of the United States Department of Agriculture current at the time of computation of the rental or from other reliable sources current at such time." 10/

In figuring the minimum rental for 1968, the price of beef cattle on the farm in Montana for the previous year was 22 cents, making the multiplier 76 cents. This figure of 76 cents is then multiplied times the animal unit month carrying capacity of the leased land to establish the minimum base rental.

Discussion with the Commissioner discloses that in the past an approximate average bid has been $1 an acre, or approximately three times the minimum base rental. Bids have been received at $10 an acre or approximately thirty times the minimum rental.

This formula may be converted to a formula for each AUM as follows:

> AUM rental = 32 cents plus 2 (last year's average beef price per pound in Montana (22 cents) plus 10 cents for grazing capacities greater than 19 animal units annually per section or minus 10 cents for grazing capacities of less than 15 animal units annually per section.

Figures released by the Department of State Lands and Investments establish that the grazing lands are administered to produce revenue. For the fiscal year ending June 1966, income from the grazing lands was

---

8/ Chapter 4, Title 81, Repl. Vol. 1 (Part 1), Revised Codes of Montana, 1947.

9/ Chapter 23, Title 46, Repl. Vol. 3 (Part 2), Revised Codes of Montana, 1947.

10/ Section 84-433, Repl. Vol. 5, Revised Codes of Montana, 1947.

$934,413.79, while the total budget for the entire Department was $143,625 for the same period. 11/ Similar correlations resulted in 1965.

Notwithstanding that no preference provisions are set forth in an original allocation of state grazing land, certain preferences are established once the land is leased. A lessee who has paid all rentals due from his lease is entitled to renewal of his lease if there are no other applicants for the leased land. In the event other applicants exist, the lessee is given "the preference right to lease the land covered by his former lease to the extent that he may take the lease at the highest bid made by any other applicant." 12/

In practice the Board receives bids from all interested parties. It then gives the lessee an opportunity to match the highest bid. If the lessee matches the bid, which must be greater than the minimum base rental, he is given the right of renewal. If the lessee feels the bid is unreasonably high, he may submit a lower bid and the Board may accept this lower bid rather than the highest.

This procedure of accepting the lessee's bid when lower than the highest bid was challenged and upheld in State v. Babcock. 13/ In this case the State Board of Land Commissioners turned down an application for a lease of agricultural lands at a 50 percent crop share and accepted the lessee's bid of 33-1/3 percent crop share. The Board's action was taken for the stated reason that the 50 percent bid was unreasonably high and that there was "danger" that a lessee at this percentage could not fulfill his term because of inability to make money or that he would cut corners on good husbandry practice. The court ruled that the Board of Land Commissioners, as trustees of state lands, owed a higher duty to the public than does an ordinary businessman. Therefore, they may not speculate as to the possibility of receiving a higher return for leased land, but must secure a sustained income which will continually benefit the public in general. As a result, the court upheld the State Board of Land Commissioners, stating that if:

> "... (T)here is considerable discrepancy in the bids as well as the character of the bidder, then the Board must utilize its discretion to determine what will most benefit the public." 14/

11/ Biennial Report for Period Beginning July 1, 1964, to June 30, 1966, Montana Department of State Lands and Investments, p. 8.
12/ Section 41-405, Repl. Vol. 1 (Part 1), Revised Codes of Montana, 1947.
13/ 147 Mont. 46, 409 P.2d 808 (1966).
14/ 409 P.2d at 813.

The leases may be for five- or ten-year terms and are issued upon the condition that the Board receives the right to withdraw the leased land from further leasing for such a period "as the Board may determine to be in the best interest of the trust fund." In practice, nearly all leases are issued for ten-year terms.

Leases may be transfered or assigned; however, to be effective an assignment must be filed with the Commissioners. A lessee may also sublease on terms equally advantageous to the sublessee as given by the state. A sublease is effective only when a copy of the instrument has been filed with the State Land office and approved by the Commissioner.

All range improvements have in the past been made by the lessee at his own expense. They may be made only with the consent of the Board of Land Commissioners. Range improvements are presently being made by the state as well as the lessee.

Investments are protected by statutory assurance that the lessee will be compensated by future lessees for the "reasonable value of such improvements at the time the new lessee takes possession thereof." If the owner desires to sell his range improvements to a new lessee and they are unable to agree on the reasonable value of the improvements, such value will be ascertained and fixed by three arbitrators, one of which shall be appointed by the owner of the improvements, one by the new lessee and the third by the two arbitrators so appointed. Appeal may be made to the Commissioner, whose decision is final. Also, by statute, Montana adds the condition that:

> "... if any of the improvements consists of breaking (meaning the original plowing of the land), and one (1) year's crops have been raised on the land after the breaking thereof, the compensation for such breaking shall not exceed the sum of two dollars and fifty cents ($2.50) per acre, and that in case two (2) or more crops have been raised on the land after the breaking thereof, then in such case the breaking shall not be considered as an improvement to the land. In case of the former lessee and the new lessee are unable to agree on the reasonable value of such improvements, then such value shall be ascertained and fixed as provided in this act...." 15/

15/ Section 81-421, Repl. Vol. 5, Revised Codes of Montana, 1947.

Leases may be canceled for any of the reasons set forth below. Compensation for the value of the range improvements has never been made upon cancellation. 16/ The statutes do not provide for compensation.

Several conditions may result in cancellation of the lease. Each lessee must "observe the ordinary rules for good range management and shall so manipulate the numbers, classes, distribution and season of the range use and the handling, feeding, breeding and marketing of grazing livestock with a view of securing the production of the maximum of livestock and livestock products, consistent with the conservation of land resources and the perpetuation of its productivity, and to these ends the state land lease shall not be abused by overgrazing." For "gross violation" of these rules the lease may be cancelled. The Board is given further discretion to cancel the lease for any of the following causes: for fraud or misrepresentation, or for concealment of facts relating to its issue, which if known would have prevented its issue in the form or to the party issued; for using the land for other purposes than those authorized by the lease, and for any other cause which in the judgment of the Board makes the cancellation of the lease necessary in order to do justice to all parties concerned and to protect the interests of the state. Such cancellation shall not entitle the lessee to any refundment of rentals paid or exemption from the payment of any rentals, penalties or other compensation due the state. 17/

The Montana statutes are silent as to criteria for allocation of forage between wildlife and domestic use. No standard procedure has been set by any state agency by which this allocation should be determined.

The grazing statutes are also silent as to provisions for trespass.

By subclassification, lands classified as "timber" lands may be designated grazing lands within the jurisdiction of the State Forester. These lands comprise a relatively small percentage of the total lands grazed in Montana. The State Forester, who is appointed by the governor with the advice and consent of the senate, administers these lands under the "supervision of the State Board of Land Commissioners." Lands classified as timber may be grazed pursuant to a "State Forest Land Use Authorization," in areas "suitable for such use where there is little or

16/ Discussion with Mons Teigen, Commissioner, State Department of Land and Investments, State of Montana.
17/ Section 41-422, Repl. Vol. 1 (Part 1), Revised Codes of Montana, 1947.

no conflict with the growing and sale of forest products." 18/ The determination as to when a conflict exists is left to the sound judgment of the forest manager. The sole criteria for conflict is whether the grazing use "materially conflicts" with the growing of timber.

The preference provisions are similar to the Board of Land Commissioners. Both agencies adjudicate the carrying capacity during the year immediately preceeding expiration of the grazing lease. All leases are for ten years unless tied to a cabin site or home site lease which is five years. Then both run for five years.

With the following exceptions the policies of the State Forester are similar to those of the Board of Land Commissioners. Range improvements are not allowed where in conflict with timber production. No definition of "conflict" is set forth. Also, the State Forester does not make range improvements.

Cooperative agreements are entered into between the State Forester and other agencies, land users, and land owners. Cooperative agreements are entered into and renewed on a year-to-year basis.

In administering grazing on timber lands, the State Forester follows Chapter 4, Title 81, Revised Codes of Montana, which governs the Board in its administration of grazing on state lands. The statement of "Policy on Special Use Permits For Grazing Purposes Issued by the Office of the State Forester" and approved by the Board of Land Commissioners February 9, 1955, are the rules and regulations adopted by the State Forester. Essentially, these rules are a restatement of Chapter 4, Title 81, and in all parts consonant with these statutes.

Important in the administration of grazing on Montana state lands is the Grass Conservation Act 19/ which provides for the incorporation of cooperative nonprofit grazing districts within the state. These grazing districts in turn are administered by state district directors. State land within the districts not otherwise disposed of by the Board of Land Commissioners must be leased by the grazing district at a reasonable rental. 20/

The Grass Conservation Act was adopted to provide a means of cooperation with the Secretary of the Interior in administration of the Taylor Grazing Act and other governmental agencies having jurisdiction over lands within Montana. Administration of the district lands is discussed in further detail under cooperative agreements.

18/ "Objectives and Policy Manual," Office of the State Forester, p. 7.
19/ Chapter 23, Title 46, Repl. Vol. 3 (Part 2), Revised Codes of Montana, 1947.
20/ Section 46-2316, Repl. Vol. 3 (Part 2), Revised Codes of Montana, 1947.

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State Grazing and Agricultural Lands in Texas

The state policy of Texas with respect to its public lands is without parallel. In the first place, there was never a federal public domain in Texas. Secondly, the State pursued three objectives in the disposition of its public lands to: (1) Secure immigration, (2) Promote education, and (3) Encourage the construction of railroads. 1/

The total acreage within the boundaries of the state of Texas is as follows: 2/

Upland acreage	169,356,000
Submerged acreage (to three marine leagues)	4,045,000
River bed acreage	1,000,000
Excess acreage	1,865,000
Total acreage	176,266,000

Although Texas set aside some 50,000,000 acres of its public domain as an endowment for its public free schools and the University of Texas, there only remains of that vast acreage about 875,000 surface acres and nearly 5,000,000 acres of submerged lands, all allocated to the Public Schools Permanent Fund, and about 2,127,407 upland acres granted to the University of Texas Permanent Fund. 3/

Over the years, the tendency has been to sell public school lands and place the proceeds thereof in a "Permanent" school fund. The proceeds are invested in specified bonds and other securities. The interest earned is placed in an "Available" fund together with lease rentals which are then used either for capital improvements or current expenses. 4/

The above procedure is followed with respect to University lands but here the "Available" fund money can only be used for capital outlay and improvements. 5/

In the spring of 1961, the Permanent Public School Fund exceeded $460,000,000. 6/ We have no figures as to the extent of the University of Texas Permanent Fund but do note that in the 1966 Business Report of

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1/ 2 Vernon's Const. of Texas, Art. 7, 11.
2/ Texas State Map by Counties, General Land Office (1967).
3/ Jerry Sadler, History of Texas Land (1961).
4/ 2 Vernon's Const. of Texas, Art. 7, 5.
5/ 2 Vernon's Const. of Texas, Art. 7, 11; 8 Vernon's Ann. Civ. St., Art. 2592 (Texas 1962).
6/ Jerry Sadler, History of Texas Land, General Land Office, 1961 at 20.

TABLE A

TAKEN FROM HISTORY OF TEXAS LANDS, GENERAL LAND OFFICE (1961)
BY JERRY SADLER, AT PAGE 20

DISPOSITION OF THE PUBLIC DOMAIN OF TEXAS
UNDER THE REPUBLIC AND THE STATE

	Acres	
GRANTS TO PROMOTE CITIZENSHIP AND TO INDUCE IMMIGRATION.		
BY SPAIN AND MEXICO	26,280,000	
HEADRIGHTS AND BOUNTIES	36,876,492	
COLONIES (PETER'S, ET AL)	4,494,806	
HOMESTEADS (PRE-EMPTIONS)	4,847,136	
		72,498,434
DONATIONS TO VETERANS.		
SAN JACINTO VETERANS (ACTS OF 1879 AND 1881)	1,169,382	
CONFEDERATE VETERANS (ACTS OF 1881)	1,979,852	
		3,149,234
SOLD TO PAY PUBLIC DEBTS BY REPUBLIC	1,329,200	
50 CENTS SALES SCRIP ACT OF 1879 AND $2 SALES SCRIP ACT OF 1887	1,560,936	
		2,890,136
INTERNAL IMPROVEMENTS.		
IRRIGATION, DRAINAGE, CANALS, INDUSTRIAL, HIGHWAYS, ETC.	4,088,640	
GRANTS TO RAILROADS	32,153,878	
		36,242,518
STATE CAPITOL BUILDING	3,025,000	
		3,025,000
EDUCATION.		
UNIVERSITY OF TEXAS	2,329,168	
PUBLIC SCHOOLS	44,443,744	
COUNTY SCHOOLS	4,229,166	
ELEEMOSYNARY INSTITUTIONS	410,600	
UNSOLD PUBLIC SCHOOL LAND	878,000	
		52,290,878
TOTAL SURVEYED LAND		170,166,000
LESS CONFLICTS (ESTIMATED)		840,000
NET ACREAGE IN ORIGINAL SURVEYS		169,356,000
EXCESSES (ESTIMATED)		1,865,000
RIVER BEDS AND VACANCIES (ESTIMATED)		1,000,000
SUBMERGED COASTAL AREA TO 3-LEAGUE LIMIT		4,045,000
TOTAL		176,266,000

the General Land Office there was over $19,600,000 deposited to the credit of that fund. Both permanent funds have been the beneficiary of large sums of oil and gas royalties, bonuses, and rentals.

For those who are interested in the general history of public lands in Texas, we refer them to the excellent study by the Commissioner of the General Land Office, Jerry Sadler, published in 1961. Table A from that publication is reproduced for a brief summary of the disposition of the public domain of Texas under the Republic and down to the present time, and attached to this report.

This study of the use of Texas public lands for grazing and agricultural purposes has been divided into two sections. This has been occasioned by the fact that the public free school lands are under the jurisdiction of the Commissioner of the General Land Office, 7/ while the University of Texas lands are under the control and management of the Board of Regents. 8/

History of General Land Office Land Commissioner

The first land commissioner in Texas was appointed by the Mexican Government in 1823, primarily to issue titles to colonists brought by Stephen F. Austin to settle on lands secured by his father, Moses Austin, in 1821, from the Spanish overnment. It was during this interval that the Republic of Mexico was born.

The Republic of Texas adopted its first constitution in 1836 wherein provision was made for a General Land Office. The General Land Office was first opened in February, 1837, under the direction of John Petit Borden, as commissioner, and has been in continuous service ever since. During its more than 130 years of operation, the General Land Office has kept a record of all state land transfers which can be found in its present offices in Austin. 9/

The General Land Office, as now constituted, is divided into the following divisions: (1) Legal, (2) Sales and Leasing, (3) Exploration and Development, (4) Engineering, (5) Records, (6) Spanish Archives, (7) Coastal Areas Management, and (8) Veterans' Land Program.

Commissioner of the General Land Office

The Commissioner of the General Land Office is provided for by the constitution and is elected at each general election for a term of two years. 10/ He is charged with the general superintendence, control and

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7/ Vernon's Ann. Civ. St., §§ 5307, 5306, 5421(c)(Texas 1962).
8/ Vernon's Ann. Civ. St., § 2596 (Texas 1962).
9/ Vernon's Ann. Civ. St., § 5261 (Texas 1962); Const., Art. 14 § 1.
10/ Const., Art. 4, Nos. 2,3; Vernon's Ann. Civ. St., Art. 5249.

direction of the General Land Office and all its employees. Specifically, the Commissioner is authorized and directed to take full charge of all matters pertaining to the lease and sale of public school lands and to keep them free from occupancy, use and unlawful enclosures. It is his duty also to make and adopt such regulations as may be necessary to carry out the intent of the legislature after first being submitted to the governor for his approval. 11/

Classification and Valuation

The Commissioner also has the duty to classify or reclassify, value or revalue state lands as grazing, agricultural or forest lands or any combination thereof as the facts dictate and the public interest requires. Land classified as agricultural shall not be sold for less than $4.50 per acre, while lands classified as grazing shall not be sold for less than $1.00 per acre. All such lands shall be sold or leased subject to a reservation of the oil, gas, coal and other minerals therein or thereon to the state fund to which the land belongs. 12/

Leasing of Public School Lands for Grazing or Agricultural Purposes

The statutory provisions applicable to the leasing of public school lands for grazing or agricultural purposes are relatively simple. 13/

All upland public school lands, that are unsold, may be leased at any time during the year for a term not to exceed five years in duration, at not less than 5 cents per acre. Such lease is subject to sale on each succeeding sale date.

Application for Lease - Recording

New leases may be initiated by any person upon application forms furnished by the Commissioner. The applicant must describe the land, the county in which it is located, and set forth the term desired, (not exceeding five years) together with the amount per acre that he will pay annually in advance. The lessee must pay the first year's rent in advance.

The Commissioner may accept the bid submitted if he believes it to be in the best interest of the Public School Fund.

Although under Article 5332 of the Vernon's Annotated Civil Statutes (1962), the Commissioner is authorized to advertise the land for leasing, apparently he need not by reason of Article 5333 of the

11/ Vernon's Ann. Civ. St., Art. 5307 (Texas 1962).
12/ Vernon's Ann. Civ. St., Art. 5310.
13/ Vernon's Ann. Civ. St., Arts. 5331-5337 (1962).

Vernon's Annotated Civil Statutes (1962) which authorized private negotiations for leasing.

The Commissioner has recourse to appraisal of the grazing lands by fieldmen at least every two years, who estimate its grazing capacity. They compare adjacent lands, ascertain the prevailing rental fees, and, based upon their judgment, set a fee which in some instances may be three or four times the minimum.

Upon acceptance of the application for lease, the clerk delivers a lease to the applicant signed by the Commissioner of Public Lands. The lessee causes the lease to be recorded in the General Land Office as well as in the county where the lands are situated.

Preference Right to Renew Leases

The original lessee, or his assignee, has a preference for 90 days after termination of first lease to another lease, provided he makes application and agrees to pay as much therefore as any third-party applicant. 14/

There appears to be no requirement that any subsequent lessee pay for improvements left on the premises.

Reservations and Conditions of Lease - Standard Surface Lease - General Land Office

The state of Texas reserves the right to sell lands under grazing leases. The lessee is given 60 days to remove his improvements. 15/

The lessee has no right or authority to cut or remove any mineral, guayule, lechuguilla or other vegetation of commercial value. Nor can the lessee sub-lease the premises, or assign the lease without the prior written approval of the Commissioner.

The lease specifically requires the lessee to allow permittees and licensees of the state of Texas the right of egress and ingress across the lessee's private lands as well as the leased premises to dig for and remove oil, gas or other minerals on the leased premises. The easement includes the right to construct or improve roads over such easements of necessity.

The lease form also sets out a maximum schedule of damages by reason of the reserved right-of-ways.

14/ Vernon's Ann. Civ. St., § 5335 (1962).
15/ Texas Land Office, Standard Lease (1964).

Improvements

The lessee is given the right to remove all improvements made by him on premises leased for grazing purposes for a period of 60 days following the renunciation of this lease. The state treats such improvements as personal property for tax purposes.

Cooperation with Other Agencies

The Commissioner of the General Land Office is authorized to grant easements over unsold public free school lands to conservation and reclamation districts in aid of soil conservation and flood protection. 16/

Such easements may be perpetual or for a term of years. The Commissioner is given wide latitude in determining whether to charge for such easements or simply require that bonds be posted to save the state harmless by reason of such easements. However, the state does reserve the right to all minerals, together with the right to explore for, produce and market the same, or to lease such lands for minerals. 17/

Damages to Surface Recoverable by Lessee

The General Land Office has limited the grazing lessee's right to damages occasioned by oil, gas, mineral and other permittees authorized by the state to use easements across such lands in the following amounts:

"1. Drill Site (including space for tank, batteries and pits) - $100.00 per location.

"2. Road Construction - $50.00 per mile per year for new roads; if on land owned by lessee, $25.00 per mile per year for use of existing roads.

"3. Pipe Line Construction - One payment of 25¢ per rod for gathering lines; 50¢ per rod for transmission lines up to and including eight (8) inches in diameter; 75¢ per rod for transmission lines over eight (8) inches; 10¢ per rod for water and fuel lines used for drilling purposes and removed when well is completed.

"4. Telephone and Power Line Construction - $50.00 per mile."

16/ Vernon's Ann. Civ. St., § 5337-(1)(1962).
17/ Vernon's Ann. Civ. St., § 5337-(3)(1962).

The maximum damages set out above does not limit the right of the lessee to bring a civil suit for damages occasioned by the negligence of third persons.

Grazing and Surface Leasing Income

Based upon the Business Reports for 1964-1965, by Jerry Sadler, Commissioner of the General Land Office, a chart summarizing the grazing and agricultural leases on public free school lands has been made.

Date	1964	1965	1966	1967
Total acres available for lease	887,620.89	888,620.89	886,147.65	887,115.68
Total acres leased for grazing uses	559,837.40	489,642.88	421,261.02	445,581.50
Total acres leased for agricultural uses	14,905.20	38,324.45	21,426.59	24,814.94
Total acres leased	574,742.60	527,967.33	442,687.61	470,396.44
Total acres not leased	312,878.29	360,653.56	443,460.04	416,719.24
Rental income				
Grazing	47,589.60	45,993.06	48,469.80	54,000.00(est)
Agricultural	10,128.08	65,851.68	26,309.73	25,000.00(est)
Total Income	57,717.68	111,844.74	74,779.53	80,456.91

A review of this chart indicates that in 1964, 559,837 acres of public school lands were leased for grazing purposes. The total income from grazing leases was $47,589.60 for that year. This would seem to indicate that the acreage rental per acre for grazing land would approximate 8 cents per acre.

In 1967, the acres leased for grazing purposes totalled 445,581 acres and the income therefrom was about $54,000. On this basis the average income per acre for grazing lands would be 12.1 cents per acre, or a 50 percent increase in four years.

There was no data available to indicate the number of cattle or sheep grazing on the leased premises. As a consequence, no figures are available for animal units grazed on the above lands.

In 1964, the number of acres leased for agricultural purposes was 14,905 with the income therefrom given as $10,128.08. On this basis, the average agricultural rental was 67 cents per acre.

In 1967, the number of acres leased for agricultural purposes was 24,814.94 acres with the rental fees totalling about $25,000. The average rental would be a little over $1 per acre. The percentage increase would approximate 50 percent over the four-year span. The agricultural rentals were not broken down into lands used for dry farming, irrigation or cotton growing as was done in New Mexico.

Termination of Leases - Lien for Unpaid Rental Fees

The state of Texas reserves the right to terminate a lease for failure to pay annual rentals within 60 days after they accrue. The Commissioner is authorized and directed to effectuate such forfeiture by filing notice of cancellation, under his seal, with other papers relating to such lease. The termination is then immediate.

The state also has a lien upon all property of the lessee to secure payment of all rentals due, which lien is superior to all other liens. 18/

A lease may also be terminated by the Commissioner upon failure of the lessee to keep all terms and conditions therein contained.

18/ Vernon's Ann. Civ. St., Art. 5336(1962).

University of Texas Grazing and Agricultural Lands

Lands Involved

By the Texas Constitution of 1876, Art. 7 § 12, there was set aside for the use of the University of Texas, 1,000,000 acres of land situated in West Texas. Subsequently, by the Act of April 10, 1883, the legislature set apart for the University of Texas another 1,000,000 acres of the unappropriated public domain in the same general area. These lands were placed in a permanent fund for the benefit of the University of Texas. 1/ Presently, the University of Texas owns about 2,102,438 acres in West Texas.

Jurisdiction Over University Lands

Since 1895, the state legislature invested the Board of Regents of the University of Texas with the right to sell, lease and otherwise manage, control and use its lands in any manner, and at such prices and under such terms and conditions as they deem in the best interest of the University and not in conflict with the state constitution. 2/

Administration of University Grazing and Agricultural Lands

The University of Texas lands were committed by the legislature to a University Permanent Fund under the administration of the Board of Regents. The latter has, in turn, created a Department of University Lands with investment and land management authority. Its offices are with the Board of Regents at the University of Texas, Austin. Presently, the University offices are managed by Mr. Floyd Shelton, Investment Office, and Mr. Wm. W. Stewart, Endowment Office. Both men were of great assistance to your writer in his work on this study.

The field office for University lands is at Midland, Texas, where Mr. Billy Carr is the land agent in charge of all surface leasing. The University Land Department is constantly in touch with local conditions through the Land Agent working in conjunction with special advisory committees authorized to study all aspects of surface leasing. The result has been a good range conservation program, with strict stocking controls and encouragement of lessees to participate in all government soil and grass conservation programs.

1/ Vernon's Ann. Civ. St., Art. 2590 (1962).
2/ Vernon's Ann. Civ. St., Art. 2596 (1962).

Leasing of University Lands

Because of the sole and exclusive authority of the Board of Regents to manage and control the use of University of Texas lands, 3/ the Board has been able to develop grazing and agricultural leases that are tailored to meet the specific needs of the area.

Standard Grazing Lease - Term and Area

Grazing leases may be for any term not exceeding five years and commencing on the first day of any month agreed to by the parties. There are no acreage limitations placed on grazing leases. 4/

Conditions and Reservations in Standard Grazing Leases

1. Rentals - Based on Animal Units Carrying Capacity

The rental fee per acre is based upon a field investigation of the carrying capacity of the land in terms of animal units per year. A comparison of the rental paid for other lands of similar capacity enters into fee determination.

For example, the University bases the price per cow at $15 per cow and $2.50 per sheep, the rates being one cow to five sheep. Thus, if the land has a carrying capacity of 15 head of cattle per section in an average year, the lessee would be charged 15 x $15 = $225 per section or 35 cents per acre. This is about the average price paid for grazing leases.

The rentals are paid in annual installments in advance to the Auditor of the University of Texas at Austin, Texas.

2. Resurveys - Binding on Both Parties

Either the lessor or lessee, at his own expense, may call for a survey of the land. Each is bound to accept the acreage indicated by the survey and adjust the rentals accordingly.

3. Reservation of Right to Withdraw Irrigable Lands - Rent Thereof

The University of Texas reserves the right to remove acreage from any grazing lease to be used for irrigation farming. When this is done the original lease is amended

3/ Vernon's Ann. Civ. St., Art. 2598
4/ University of Texas Standard Lease Form UL-1, Approved 12-2-61.

to reflect the withdrawal of acreage both as to area leased for grazing and rentals paid by lessee.

The lessee may wish to irrigate and this is done by attaching to the standard grazing lease form a supplement, granting the lessee a right to farm a part of his acreage. The lessee bears the total cost of preparing the acreage for cultivation.

Currently, in Pecos County, $8 per acre per year rental has been arrived at by considering the productivity of the land, and by comparison with other farm leases in the same area. The cost of preparing the land for irrigation and supplying water are factors which must be considered in the initial years of an agricultural lease, in setting a fair rental.

Reservation of Right to Withdraw Other Lands for Water Exploration - Oil and Gas

The lessor also reserves the right during the term of the lease to issue such permits or leases for the exploration and development of water resources as it may deem necessary and proper. Such action is sometimes required to protect ground water supplies on University lands that are being drained off by wells situated on private lands adjacent to University property.

4. Number of Livestock to be Grazed - Special Permits - Fee - Inspection

The lease specifies the number of cattle, sheep, goats or horses that be grazed annually on the leased premises. The increase from such animals are not included until November 1 of the year in which they are born.

In the event the lessee desires to run more livestock than specified in the lease, he must apply to the University Land Agent for a special permit to do so. Before the special permit will be issued, the Land Agent must be satisfied after an inspection of the premises that such livestock can be pastured without undue damage to the land and upon agreement by the lessee to pay an additional fee of $2 per animal per month for all livestock pastured in excess of the number originally agreed upon.

The number of livestock pastured is subject to inspection by an authorized agent of the University at any time. Any violation of this provision subjects the lease to cancellation upon 60 days written notice to the lessee.

In commenting on this situation, Billy Carr, the land agent, has written: 5/

> "There are many years that drought conditions keep a lessee from running his maximum number of stock. He is not allowed to make up the difference in good years. Therefore, a lease will average running, over a five (5) year period, about 60% of the maximum number of stock allowed."

5. Lease Intended for Needs of Lessee's Livestock

The lessee must not make contracts to pasture livestock other than his own without first obtaining the written consent of the Land Agent. This limitation applies also the permitting of others to use the premises for purposes other than those specified in the lease, nor may the lessee or his licensee remove from the premises any water, shrubs, rock, sand, gravel, caliche or other similar materials.

In interpreting this condition in the lease, Mr. Carr has commented that it would be in very rare circumstances that permission could be given to pasture livestock owned by others. As an example, it might be allowed for a few months only, when weather conditions were good, the number of livestock being grazed were below the permissable number, then, if the lessee did not wish to buy other livestock to pasture the land, he might be permitted to allow other livestock to graze thereon, but not in excess of the number specified in the lease. 6/

6. Lessee Must Protect From Trespass and Prevent Waste

The lessee is charged with the duty of preventing trespass, control of prairie dogs, weeds and other nuisances. This duty can normally be performed by the lessee participating in government soil and conservation programs, which the Land Agent encourages. Presently, more than 90 percent of the lessees are actively engaged in such programs without charge to the University. 7/

5/ Report on Surface Leasing, University Lands in West Texas, 1965, p. 2, hereinafter referred to as Billy Carr Report.
6/ Id.
7/ Id. at 3.

7. Improvements - Become Property of University - Duty to Maintain

Under the University grazing lease all improvements made on the property become the property of the University. The lessee has the duty to maintain and keep all improvements in a reasonable state of repair, ordinary wear and tear excepted. This obligation extends to those improvements on the premises when leased as well as to those subsequently added by the lessee at his own expense.

In applying this provision the University permits the lessee, if he sells or assigns his lease, with the consent of the Land Agent, to deduct from the proceeds of the assignment the undepreciated value of the improvements. Thus, if a barn were built costing $1,000 four years before the assignment, the lessee could deduct $600 for undepreciated value. Depreciation is figured at 10 percent per year. 8/

The lessee must furnish a "sketch" of the premises showing any improvements, their location and cost and any other information concerning said land or lease whenever requested to do so by the lessor.

8. Reservation of Easements

The lessee covenants to accept the lease subject to any and all easements, rights-of-way on, over or across said lands which have been or may hereafter be granted by the University.

This covenant is tempered in practice by requiring the intended grantee of the easement to obtain the consent of the lessee in advance. 9/ The University has a set schedule of fees for such easements.

9. Multiple Leasing for Oil and Gas Development - Damages

Because of the inherent tensions usually resulting from multiple leasing, section 9 of the Standard University Grazing Lease is quoted at length to illustrate in particular its way of providing for damages:

> "It is agreed and understood by and between Lessor and Lessee that the land covered by

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8/ Id.
9/ Id. at 3, § 8.

this lease is subject to development and prospecting for oil, gas, or other minerals, and Lessee hereby waives any and all damages that may be occasioned or caused by reason of said exploration, development, or production of oil, gas, or other minerals on said land, except actual damages as may be occasioned or caused to grass, crops, improvements, or livestock. Damages to livestock shall be limited to such damages as may be occasioned or caused by and through the negligent operations or acts committed by any oil and gas or other mineral permittee or lessee and to those killed or injured by reason thereof on the premises covered hereby. Lessee hereby agrees to claim only the fair market price or value for such livestock so killed or a reasonable amount for those so injured. It is further agreed and understood that where Lessee hereunder cannot agree with any lessee under any oil and gas, or other mineral lease or any permittee under any geophysical permit as to the amount of damages, if any, that may be sustained by Lessee hereunder, then Lessor shall have the right, without any liability as to payment, to fix and determine such amount and when such amount is fully paid, the Lessee hereunder shall have no further claim against said oil and gas or other mineral lessee or geophysical permittee, and the decision of Lessor hereunder in respect thereto being final as to all parties. If oil, gas or other minerals should be discovered and produced upon any portion of the land involved in this lease, then this lease may be cancelled by either party to the extent of the land necessary to the proper development and production of said oil, gas, or other minerals, or should the rental rate be reduced because of acreage being in oil or gas field areas or involved in the exploration and development of other minerals, Lessee shall not collect any damages to the grass or land due to oil, gas or other mineral operations on the area on which the rental is so reduced. This provision shall not affect Lessee's right to collect damages for the loss of or injuries to livestock due to negligence in such oil, gas or other mineral operation."

10. Ingress and Egress Over Non-University Lands

The lease at section 10 provides for ingress and egress over private lands owned or controlled by the lessee which are contiguous to University lands for the benefit of authorized permittees to carry out their oil, gas and geophysical operations. The easements so obtained also include the right to open, construct, and maintain roads, bridges, gates and cattle guards necessary to carry out their operations.

11. Termination of Lease for Failure to Pay Rent - Lien

In the event the lessee fails to pay any installment of rent when due, the installment shall bear interest at the rate of 10 percent per year from the due date until paid. Should the installment of rent remain delinquent for more than 60 days the rental for the entire term becomes due and payable without further notice and the lessor may proceed to collect the entire sum. The lessor is given a first lien upon all the property of the lessee located on the leased premises including livestock to secure the rental payments. Or, the lessor may at his option proceed to cancel the lease, re-enter and take possession of the leased property without prejudice to his right to any claim for rents in arrears.

12. Indemnification of Lessor

The lessee agrees to indemnify and save harmless the lessor by reason of any claim made by any person which results directly or indirectly from the use by lessee of the premises covered by the lease.

13. Violation of Terms and Conditions of Lease - Termination

The violation of any of the terms and conditions of the lease is grounds for the cancellation and termination thereof at the option of the lessor. Failure to exercise such option is not a waiver of subsequent violations. Suit may be brought for the purpose of enforcing any of the provisions of the lease, in any court in Travis County, Texas, having jurisdiction over the subject matter.

14. Assignments and Subleases

The lessee may neither assign nor sublease the premises without first obtaining the written consent of the lessor. In the event of an assignment, the lessor shall receive one-half of all increases in rentals or bonuses

given in consideration for the assignment. Should the lessor refuse to consent to the assignment, he does not waive his right to cancel the lease. The value of the improvements as set out in paragraph 7 above shall first be subtracted from the consideration for the assignment before the lessor's half thereof is computed.

15. Lessee's Right to Renewal of Lease - Preference

The lessor is in no way obligated to renew or extend the terms of the lease. However, the lessee is given the first preference in the renegotiation of a new lease, including rentals, if done 90 days before the expiration of the current lease. Otherwise the lease terminates on the date of its normal expiration.

Grass Grazing Lease Rentals

During the past five years there has been a steady rise in grass rentals received from the use of University grazing lands. The following chart has been prepared from figures supplied by Billy Carr, land agent, Midland, Texas, in a letter under date of January 17, 1969.

Grazing Lease Rentals

Year	Grass Acreage	Grass Income	Estimated Rental/Acre	Percent Increase
1964	2,084,346.96	640,708.30	30.7¢	
1965	2,084,346.96(est)	653,055.75	31.3¢	
1966	2,084,346.96(est)	670,519.05	32.1¢	
1967	2,084,346.96(est)	671,410.70	32.2¢	
1968	2,084,346.96(est)	755,386.09	35.7¢	20%

In 1965 the grazing rentals ranged from 15 cents to 65 cents per acre with 50 cents per acre a rather common price even where the leases ran from 6,775 acres to ranches of over 36,667 acres.

An Example of Grazing Management

The following letter from Mr. Billy Carr, land agent, addressed to Mr. Wm. W. Stewart, Endowment Officer, University of Texas, Austin, under date of May 7, 1965, sets forth the computations and a discussion which points up the practices observed by the Land Agent in range management and rental increases.

"The grazing rental rate is based on $15.00 per cow and $2.50 per sheep per year. These rates were increased from $12.00 per cow and $2.00 per sheep per year in 1964. As each lease comes up for renewal it will be renewed at the increased stocking rate price. This will put into

effect a 20% cut in the stocking rate on University lands. This, in actuality, means that the rancher will be paying 20% more rental per head of stock. The University will not benefit from this increase dollarwise, but will benefit from having better rangeland in the future. Along with the decrease in livestock, the rental rates are being increased by about 20% on approximately 300,000 acres of University land in Schleicher, Reagan, Crockett and Irion Counties. This increase is the result of better range conditions due to strict stocking controls in the past on the bitter-weed area. I would like to set forth an example of rental and stocking rates on the L. D. and Clifton B. Brooks lease through three (3) renewals:

Lease No. 643	Lease No. 777	Lease No. 910
1/1/50 - 12/31/59	1/1/60 - 12/31/64	1/1/65 - 12/31/69
23,124.5 acres	23,124.5 acres	23,124.5 acres
$.35 per acre	$.42 per acre	$.50 per acre
3,600 sheep	2,880 sheep	2,165 sheep
600 cattle	325 cattle	410 cattle
100 goats	0 goats	0 goats
Animal Units/Sec. 36.6	Animal Units/Sec. 25.0	Animal Units/Sec. 24.0
Cost: $6.12	Cost: $10.25	Cost: $13.33

This example reflects the type of stocking controls I am trying to put into effect on our grazing leases. Also, it reflects the increased cost per animal unit. (1 cow or 5 sheep = 1 unit)"

State Grazing and Agricultural Lands in New Mexico

History of New Mexico State Land Office

The New Mexico State Land Office located in Santa Fe, New Mexico has a history dating back to September 9, 1850, when Congress created the Territory of New Mexico. 1/ The boundaries of the Territory were designated in the Organic Act as extending from the 103rd Meridian of Longitude on the east to the Territory of California on the west. It was not until 1863 that its present boundaries were determined by the creation of the Territory of Colorado in 1861, from the northern portion, and of the Territory of Arizona from the western portion in 1863.

Title to this vast area consisting of more than 77.8 million acres was in the United States and constituted public domain lands with the exception of the Spanish Land Grants which were recognized under the Treaty of Guadalupe Hidalgo, concluding the Mexican War in 1849.

Origin of State Lands

Territorial Legislation

In 1898 Congress passed the Ferguson Act 2/ under which Sections 16 and 36 in every township were given to the Territory of New Mexico to be used for school purposes. In the event these sections in any particular township happened to be mineral lands or had otherwise been sold or appropriated under the mining or homestead laws, then the Territory was entitled to make lieu selections from other unappropriated non-mineral public domain.

Other provision of the Ferguson Act provided generally as follows:

1. Fifty (50) sections of land were given to the Territory for capitol building purposes.

2. Two (2) townships, approximately 65 thousand acres, of non-mineral lands, otherwise unappropriated were given to the Territory for University purposes, and 100 thousand acres for agriculture colleges.

1/ Organic Act, September 9, 1850, 9 Stat. 446.
2/ June 21, 1898, 30 Stat. 484.

3. Five percent (5%) of the net sales of all other public domain lands was appropriated to the Territory for its Common Schools fund.

4. In lieu of swamp lands given to other states under various federal laws, grants were made to the Territory as follows:

500,000	acres for water reservoirs
100,000	acres to increase river flow
50,000	acres for Insane Asylum
50,000	acres for School of Mines
50,000	acres for School for Deaf and Dumb
50,000	acres for School for Blind
100,000	acres for Normal Schools
50,000	acres for Miners' Hospital, Palace of Governors on the Santa Fe Plaza and appurtenances

5. It was specifically stated in the Act that these grants were only partial and that more would follow when statehood was granted to the Territory.

6. These lump acreage grants were to be selected from the public domain by a commission consisting of the governor and surveyor-general, under the direction of the Secretary of the Interior.

7. The Commission was to select such lands by legal subdivision from non-appropriated, non-mineral lands of the public domain. By non-mineral it was meant that lands had not theretofore been classified as mineral.

8. Lands were to be leased by the Territory, acting through a separate board, until the Legislature met. No lease was to exceed five years, and the proceeds derived from the various granted lands were to be kept in separate trust funds for each beneficiary. No tract of more than 160 acres was to be sold to any one individual, and a minimum sale price of $1.25 an acre was established.

State of New Mexico was Created

The Enabling Act 3/ was passed by Congress, paving the way for statehood for the Territory. Under the provisions of this Act, the people of the Territory chose delegates for a constitutional convention and drew up a constitution containing certain restrictions and safeguards required under the Enabling Act.

This constitution was then submitted to the people of the Territory for vote and, on January 21, 1911, was adopted and thereafter referred to the President and to Congress for ratification. By presidential proclamation dated January 6, 1912, 4/ the Territory of New Mexico became the State of New Mexico.

Article 21, Section 9, of the New Mexico Constitution is the article under which the terms of the Enabling Act were accepted and, by Article 13, Sections 1 and 2 of the Constitution, provision was made for a Commissioner of Public Lands to take control, jurisdiction, care and custody of the lands as agent for the State.

Under the Enabling Act of 1910 provisions for additional appropriations of land from the public domain were made as follows:

1. In addition to Sections 16 and 36, which had been granted to the Territory under the Ferguson Act, Sections 2 and 32 in every township which were non-mineral and not otherwise appropriated, were given to the State to be sold or leased to obtain revenues for the Common Schools. If these sections were mineral or already appropriated, provision was made for the State to select lieu land elsewhere from the public domain. By a later amendment it was provided that if these lands fell within the national forest, title was to remain in the United States, which would administer them and give the income to the State until lieu selections were made.

2. In addition, the following lands were granted to the State:

   200,000 acres for State University
   100,000 acres for Public Buildings
   100,000 acres for Insane Asylum
   100,000 acres for Penitentiary
   100,000 acres for Schools for Deaf, Dumb and Blind
   50,000 acres for Miners' Hospital

3/ Act of June 20, 1910, 36 Statutes at Large 557, Chapter 310.
4/ 73 Statutes at Large 1723, Vol. 1, Page 43, N.M.S.A. (1962 Compilation).

   200,000 acres for Normal Schools
   100,000 acres for Charitable, Penal and Reform
   150,000 acres for Agricultural and Mechanical College
   150,000 acres for School of Mines
   100,000 acres for Military Institute
   1,000,000 acres for Grant and Santa Fe County Bonds to revert to Common Schools after bonds paid

3. Five percent (5%) of all sales of public domain land within the State were to go into the State's permanent school fund.

4. Section 10 of the Act placed certain restrictions and limitations on the use and disposition of the granted trust lands. The major points embodied in these restrictions were:

   a) Lands and all funds derived therefrom were declared to be held in trust. If further provided that income from the various lands was to be held in separate funds and that each beneficiary was to be credited with the income from the lands which had been appropriated to it. There could be no co-mingling of funds.

   b) Lands cannot be encumbered or mortgaged (by the State).

   c) All sales of lands or natural products thereof to be made only after advertising in the newspapers, and at public auction.

   d) Before any land or the natural products of the land could be sold, they had to be appraised and could not be sold for less than "true value." In no event could lands be sold for less than $5 per acre if they lay east of the line between Ranges 18 and 19 East, New Mexico Principal Meridian, and not less than $3 per acre if west of that line. Irrigated lands were to be sold for not less than $25 per acre.

   e) Any sale, lease or contract, relating to use or disposition contrary to the above was absolutely void, and the Attorney General of the United States was charged with enforcing the act.

f) Provision was also made for later exchange of lands by the United States and the State under certain circumstances.

Thereafter, 250,000 acres of land were granted to the State to use to pay interest which had been paid by Grant, Luna and Hidalgo Counties on invalid bonds. It was provided that when this indebtedness had been paid, any land that was left in the grant would revert to the Common Schools.

There have also been other federal acts granting small amounts of acreage to the State, such as the Bear Canyon dam site on the Mimbres River, the Fort Stanton Hospital area, and the Bruns Hospital site.

There were approximately 13 million acres originally granted to the Territory and State. The pattern of state ownership has changed throughout the years because of sales of individuals, exchanges with the federal government and condemnations of land by the federal government, usually for military or defense purposes.

Commissioner of Public Lands - Jurisdiction over State Lands

The Commissioner of Public Lands was designated by the Enabling Act of 1910 and by Section 1 of Article XIII of the New Mexico Constitution to act as the agent of the State in the execution of its trusteeship over state public lands.

The Commissioner of Public Lands replaced the United States Surveyor General who had been the land administrator during Territorial days. The Commissioner is elected by popular vote and serves as an officer of the executive department of the state for a term of four years. His duties are "to select, locate, classify, and have the direction, control, care and disposition of all public lands under the provision of the Act of Congress relating thereto and such regulations as may be prescribed by law." 5/ He is also authorized by the same statute to make such rules and regulations for the control, management, disposition, lease and sale of state lands and perform such other duties as may be prescribed by law.

The exercise of such powers of administration has been the occasion of some conflict between the legislature and the Commissioner. 6/ In a more recent decision the Supreme Court of New Mexico has apparently settled upon the view that the Commissioner has complete dominion and control over state lands subject to the restrictions set up in the Enabling Act, State Constitution and statutes. 7/

5/ Sec. 7-1-2, N.M.S.A. (1962 Compilation).
6/ State v. Field, 31 N.M. 120,241 Pac. 1027 (1925), Swayze v. Bartlett, 58 N.M. 504,273 p. 2d 367 (1954).
7/ Sproles v. McDonald, 70 N.M. 168,372 p.2d 122 (1962).

Advisory Board to Commission

Since 1953, the several commissioners have selected and appointed a Land Office Advisory Board consisting of nine public-minded individuals who represent all of the various groups vitally concerned in the administration and use of state lands. The present (1968) Advisory Board members and the groups they represent are as follows:

Ladd Gordon, Game and Fish.	Sportsmen Groups
Leonard DeLayo.	Common Schools
Bill Saffold, Kennecott	Mining Industry
V. F. Foy, Prospector	Small Miners
William O'Donnell, N.M. State U.. . .	Higher Learning
Scharbauer Edison, Rancher.	Livestock Industry
Jim Colegrove	Press and the People
L. B. Hodges.	Oil and Gas
Jim Anderson, B.L.M..	Public Domain

This arrangement appears to have resulted in a relatively simple and uniform system of laws and regulations under which the State Land Office has operated in an efficient and competent manner in the discharge of its duties to the state of New Mexico.

The work of the office is carried out through various departments or divisions by about one hundred employees. The principal divisions include a Field Office, Fiscal, Grazing, Land Contracts and Sales, Legal, Minerals, and Oil and Gas Departments.

An individual tract book index system is individually maintained by the Grazing, Oil and Gas, and Mineral Departments due to the vast amount of activity generated in these various areas of land development. Each tract of land owned by the State of 640 acres or less is given a specific page in the tract indexes which are identified by range and township. Entries are made as to each transaction affecting the particular land involved. The result is a running inventory which presents the current status of all lands under the jurisdiction of the Land Commissioner.

Contracts and Sales

All state lands are subject to sale and multiple leasing by the Commissioner, in his discretion, under the conditions and terms prescribed in the Enabling Act, Constitution and statutes of the state of New Mexico. 8/ Under the Enabling Act such lands must be appraised and sold at public auction. Such sales of land cannot be for less than their "true value." In no event can lands be sold for less than $5 per acre if they lie east of the line between Ranges 18 and 19 East, New

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8/ Sec. 7-1-1 et seq., N.M.S.A. (1962 Compilation).

Mexico, Principal Meridian, and for not less than $3 per acre if they lie west of that line. Irrigated lands may not be sold for less than $25 per acre.

Sale of State Lands

The sale of state lands does have several direct effects on the leasing of state lands for grazing or agricultural purposes. The most evident, of course, is that as more lands are sold, less lands will be available for grazing. The sale or possibility of sale of state lands has a tendency to make stockmen more keenly aware of the need to acquire or maintain their present leases. Other factors of more recent origin have made the sale of state lands appealing to many people. The desire to invest funds in real property as a hedge against inflation; the income tax benefits resulting from capital gains, as against ordinary income; and, the need for land for industrial growth, recreation and home building have all added pressures upon the Commissioner to sell off state lands. It should also be noted that where the average grazing fee in New Mexico is about 10 cents per acre and land sales average out more than $10 per acre, it is apparent that the state is foregoing the opportunity to acquire an additional 40 cents per acre each year on the land in question.

In consequence of these factors, the Commissioner and the Advisory Board are confronted with a problem of many dimensions. As agents for the state, which has the responsibilities of a trustee to all the people, the Commissioner must weigh all the consequences of a sale as compared to a lease of the lands.

Between the years of 1912 and 1964 about 3 million acres of state lands had been sold. On December 1, 1964, E.S. Johnny Walker, Commissioner of Public Lands, imposed a moratorium on the sale of public lands. 9/ Mr. Walker stated that if the present rate of sales were continued, that within 10 years there would be no more state land. The moratorium provided exceptions for sale to municipalities, county, state or federal governments and in cases where lands were needed for commercial development.

Conversations with the Chief of the Contracts and Sales Division disclosed that about 600 acres were sold during the year 1968. One tract of 40 acres was sold at $2,800 per acre.

9/ N.M. Land Office, News Release of December 1, 1964.

Grazing and Agricultural Leases

Under Section 10 of the Enabling Act of 1910 the State of New Mexico 10/ the Commissioner of Public Lands was authorized to sell or lease public lands at their "true value." It was not, however, until 1919 that the legislature authorized the Commissioner to obtain full and complete data as to the nature, character, quality and value of the state public lands and their adaptability for grazing, stock farming and agriculture, 11/ and to install in his office a system of maps, plats, and tract books as shall be necessary and convenient for properly recording such data as he might acquire relative to the character of the state's lands. 12/

Applicants for Grazing or Agricultural Leases

Any person, not a state officer or employee, may make application to lease state lands, under oath on forms furnished by the State Land Department. Applicants must, at their own expense, procure appraisements of such land by one or more disinterested persons, under oath, which is not however binding upon the Commissioner. 13/

Lands Subject to Lease

There are now more than 9 million acres of state land available for grazing or agricultural leasing in the state of New Mexico. These lands are held by the state of New Mexico on trust and managed by the Commissioner of Public Lands for the benefit of 22 state institutions, i.e. Common Schools, University of New Mexico and others. 14/

The regulations of the State Land Office provide that all lands shown to be open upon the tract books of the State Land Office and not classified as business property, are subject to an application for lease. This includes lands the leases on which have expired or which have been cancelled by the Commissioner. Lands which are under leases which are about to expire are also subject to an application for lease by a third person. 15/

10/ 36 Stat. 557.
11/ Sec. 7-6-1, N.M.S.A. (1962 Compilation).
12/ Sec. 7-6-2, N.M.S.A. (1962 Compilation).
13/ Sec. 7-8-1, 7-8-2, N.M.S.A. (1962 Compilation).
14/ Annual Report, Commissioner of Public Lands, New Mexico State Land Office, 1967-1968.
15/ Rules and Regulations, State Land Office (1965)

Business property excepted from leasing includes all lands within the corporate limits of any city, town or village as well as those lands which the Commissioner has or may determine to be particularly suitable for business purposes. Those lands so classified as business property which are included within any existing grazing or agricultural lease will be withdrawn from such lease upon expiration or the current five-year term. 16/

The Commissioner may, in his descretion, withhold from leasing any land, either before or after application for leasing for grazing or agricultural purposes, if in his opinion the best interest of the state of New Mexico would be best served by so doing. 17/

All lands so leased are subject to sale under rules to be discussed. The purchaser takes title to the land subject to the current lease. 18/

Application to Lease

The application to lease must be made upon forms furnished by the New Mexico State Land Office. In substance, the form requires the applicant to be at least 21 years of age, or the head of a family. A legal description of the lands sought to be leased, together with the amount of money tendered in payment of the lease and the term desired, not exceeding five years.

In addition, the applicant must answer detailed questions as to the purpose of the lease: 1) Whether such lands are within the applicant's present pasture or grazing allotment, 2) the nature, extent, location and value of all improvements on the land, 3) the extent of water, mineral or timber resources on the land, and 4) are the lands susceptible of or now being irrigated. The applicant must state what private lands in the vicinity are leasing for and give two or more credit references.

In addition to the application, the applicant is required to provide at his own expense and upon a form furnished by the State Land Office, an appraisement of the land sought to be leased. The appraisement must be made by a disinterested person, familiar with the land, including its location with respect to railroads, irrigation ditches, the occurence of natural streams, lakes and springs, and the adptability of the land to grazing. The improvements, if any, must be described, located and valued by the appraiser, all under oath. 19/

16/ Regulation 3, Rules and Regulations, State Land Office (1965).
17/ Regulation 4, Rules and Regulations, State Land Office (1965).
18/ Regulation 5, Rules and Regulations, State Land Office (1965).
19/ Rule 10, Rules and Regulations, State Land Office (1965).

The Commissioner reserves the right to reject all applications if not accompanied by proper deposit or if the applicant fails or refuses to furnish the information requested. 20/

Term and Form of Leases

Grazing or agricultural leases may be made without advertisement and public auction for a period not to exceed five years, 21/ upon forms furnished by the Commissioner containing such terms and conditions as required by law together with those deemed warranted under the circumstances. 22/

The lease year begins on October 1 and extends to September 30. When a lease is issued after October 1 of any year the lease shall extend for the balance of the lease year and for not more than four additional lease years terminating on September 30 of that year.

Preference Right to Initiate a Lease

The New Mexico statutes afford a preference in the lease of grazing and agricultural lands under the following circumstances:

1. Any person, association or corporation authorized to transact business in New Mexico, occupying any lands the title to which is acquired by the state by operation of law has a preference right ot lease such lands provided the preference is exercised within 30 days of the acquisition of title by the state. 23/

2. Persons, association of persons or corporations having a domicile or paying taxes in New Mexico shall have a preference in leasing state lands provided the rental offered to be paid is at least equal to that otherwise obtainable. 24/

3. Municipalities have a preference right to lease any state lands situated within five miles of such municipality for municipal purposes (airports, parks, fair grounds and other public purposes) for a period not to exceed 25 years

20/ Rule 11, Rules and Regulations, State Land Office (1965).
21/ Sec. 7-8-31, N.M.S.A. (1962 Compilation).
22/ Rule 8, Rules and Regulations, State Land Office (1965).
23/ Sec. 7-8-57, N.M.S.A. (1962 Compilation).
24/ Sec. 7-8-47, N.M.S.A. (1962 Compilation).

upon such reasonable terms and conditions as the Commissioner of Public Lands may prescribe. 25/

4. County and school districts within the state of New Mexico which have a use for any state lands for any purpose; incidental to the powers of such county or school district have a preference right to the lease of such lands without limitation as to distance from such political entities. The Commissioner is authorized to make such leases for a period of 25 years upon such reasonable terms and conditions as he may prescribe. 26/

5. Before the application of any municipality, county or school district be preferred such public entity must pay the reasonable value of any improvements placed upon such state lands by a former lessee for the use of the owner of such lands. 27/

6. Qualified preference right to renew lease is given to lessee.

"Existing Lessee - Competitive Bids. Every lessee desiring a new five-year lease covering the same lands for a term not to exceed five years shall make application for such new lease to the Commissioner on or before August 1st next preceding the expiration date of his existing lease. Every other applicant for a like lease on such land shall make proper application on or before September 1st next preceding the expiration date of such existing lease. In case more than one application is filed, one of which is the holder of the existing lease, after having been served with the written notice of the name and address of the applicant offering the highest annual rental, shall, prior to October 1st the expiration date meet such offer, and has in good faith, complied to the satisfaction of the Commissioner with all the requirements of his existing lease, then the

25/ Sec. 7-8-58, N.M.S.A. (1962 Compilation).
26/ Sec. 7-8-29, N.M.S.A. (1962 Compilation).
27/ Sec. 7-8-60, N.M.S.A. (1962 Compilation).

lease shall be awarded to him if to anyone. Provided, however, this preference right shall be construed as a relative and not absolute right, said right being subject to the sound discretion of the Commissioner and other superior rights to lease as provided by law. Any bid on any land covered by an existing lease, in the last year of its term, must be a per-acre offer on the entire tract covered by such existing lease, and no bid or offer may be considered on any part of a lease less than the whole thereof. Furthermore, blanket bids on more than one lease will not be considered. Separate bids and applications are required for each separate lease.

"Any bid on any land covered by an existing lease must be accompanied by money order, cashier's check, bank draft, or certified check in the amount of the improvements thereon, together with the first year's rental as per bid submitted, and a $2.00 application fee, payable to the order of the Commissioner. Personal checks are not acceptable. In addition, promissory notes for the balance of the lease term, as required by law, must accompany the bid." 28/

Notwithstanding the preference at the termination of each five-year lease, the land is subject to reclassification by the Commissioner and competitive bidding by third persons. The prior lessee has the option of leasing such lands at the highest bid offered by the third party. 29/

This qualified right of a lessee to renew a state lease is extended to a lessee holding an outstanding lease on federal lands acquired by the state of New Mexico by exchange from the United States Government or when acquired as a lien selection under the provisions of Section 11 of the New Mexico Enabling Act. 30/ The outstanding leases on lands so acquired are duly recognized and treated as if the leases originated with the state of New Mexico.

A specific preference is accorded to a Taylor Grazing Act lessee with respect to open and unleased state lands lying within the latter's permitted grazing allotment provided such lessee duly avails himself of such opportunity. 31/

28/ Sec. 7-8-51, N.M.S.A. (1962 Compilation); Rule 6, Rules and Regulations, State Land Office (1965).
29/ Sec. 7-8-51, N.M.S.A. (1962 Compilation).
30/ 36 Stats. 557, Section 310.
31/ Sec. 7-8-33, N.M.S.A. (1962 Compilation)

Grazing and Agricultural Leasing Fees - Minimum Rentals

Guidelines for determining grazing and agricultural leasing fees for the use of state lands in New Mexico are set forth in its Enabling Act of 1910, Section 10; Constitution, Article XIII, Section 2 and, Statutes, Sections 7-8-28, -29, -30, N.M.S.A., 1962 Compilation.

Under the Enabling Act of June 20, 1910, 36 Statutes 557, the United States Government granted to the state of New Mexico about 13 million acres of land, on trust, for the benefit of its educational system and other public functions. As trustee, the state of New Mexico was charged with the duty to appraise such lands at their "true value" and no lease or sale thereof shall be made for a consideration less than the value so determined. Any sale, lease or conveyance "not made in substantial conformance with these provisions shall be null and of no effect any provision of the Constitution or laws of the state to the contrary notwithstanding." 32/

The Constitution of the state of New Mexico provided for the election of a Commissioner of Public Lands, to act as the agent of the state in the discharge of duties as trustee of the public lands. The Constitution authorized and directed the Land Commissioner to select, locate and classify all public lands and entrusted their direction, control, care and disposition to him under the provisions of the Acts of Congress relating thereto and such regulations as may be provided by law. 33/

Subsequently the state legislature enacted Chapter 82, Laws of 1912, which directed the Land Commissioner to classify and determine the value of all state grazing lands as soon as practicable. That in the determination of such value the Commissioner of Public Lands should take into consideration the carrying capacity of such lands, "that is, the number of livestock such lands will reasonably carry per annum without injury to such lands. 34/

The statute as amended in 1951 further provided that five sheep should be treated as equivalent to one cow. That in determining carrying capacity the Commissioner should take into consideration the findings by the grazing service of the Bureau of Land Management, the Forest Service, or other federal agencies, and the New Mexico State Tax Commission as to carrying capacity of comparable lands within the state. 35/

The Commission was also directed to take into consideration economic conditions at arriving at the value of grazing lands for leasing purposes. And, in the renewal of any grazing lease, the

32/ Enabling Act of 1910, 36 Stat. 557 at Section 10.
33/ New Mexico Constitution, Article XIII, Sec. 2.
34/ Sec. 7-8-30, N.M.S.A. (1962 Compilation).
35/ Ibid.

Commissioner is authorized to reduce the minimum rentals set by statute by not more than 33-1/3 percent provided severe drought or economic conditions, in his judgment, required such reduction.

The statutory history of grazing fees and minimum rentals on state lands is interesting:

1912 - The minimum rental shall be 2 percent of appraised value, with no lease issued for less than $10. (This would mean that if the land was appraised at $10 per acre the minimum rental would be 20 cents per acre or $128 per section.) 36/

1915 - The legislature amended the law of 1912, 2nd struck the minimum of $10 per acre. 37/ (Hence, if land were valued at $1 per acre, the minimum rental would be 2 cents per acre, or $12.80 per section.)

1921 - The 1915 Act was amended to read that the Commissioner should classify and evaluate all state lands as soon as practicable, and the minimum rental fee was set at 3 cents per acre. However, the minimum should not apply where lands for leasing were advertised and let to the highest bidder. (This would seem to indicate that, if one were to retain the 2 percent of value as a minimum rental, no land could be appraised at less than $1.50 per acre.)

1951 - House Bill No. 247, approved March 14, 1951, rewrote Section 8-830 of the 1941 Compilation to provide that grazing fees should be determined on a carrying capacity of the land and economic conditions. The Act then added that all grazing leases entered into after September 30, 1951, shall carry an annual rental per acre of at least four-tenths of a cent times the approximate number of cows said land will carry per section, but in no event shall the annual rental be less than 3 cents per acre. (The new criteria for fixing rental fees based on carrying capacity and economic conditions was realistic. Thus, if the carrying capacity was ten cows per year, the rental would be 4 cents per acre per year or $25.60 per section. Translated into animal units per year the cost was $2.56 or 51 cents per year per sheep. The minimum of 3 cents per acre or $19.20 per section was carried forward into the 1951 law. This sum would in theory cover all

36/ Law of 1912, Chapter 82 § 13
37/ Law of 1915, Chapter 73 § 2.

lands having a carrying capacity of about eight cows or less per section per year.)

1961 - The legislature raised the grazing fees in 1961 based again on carrying capacity and changed economic conditions. The minimum rental of 3 cents per acre was retained. The new rates were such that if the carrying capacity were ten cows per section; then the annual rental would be 8 cents per acre, or $51.20 per section. This would mean that it would cost $5.12 to pasture one cow on leases beginning after September 30, 1962, as compared to $2.56 in 1952, the effective rate being doubled in a ten-year period. 38/

Prior to the above action by the 1961 legislature, the Commissioner of Public Lands conducted a study of the leasing practices on state lands of 16 western states. The study indicates that the average rental per acre for grazing lands was about 4.5 cents per acre whereas after the increase in rentals occasioned by the action of the 1961 legislature, the average rate rose to about 10 cents per acre.

It would appear from the above mentioned report that the grazing fees in Colorado are higher (20 cents minimum per acre) than those in New Mexico. The physical evidence of the disproportion in grazing fees between Colorado and New Mexico was physically demonstrated by comparing the grazing fees charged on the south half of those sections cut by the state line dividing New Mexico and Colorado. The study showed that the grazing fees charged in Utah, Arizona and Texas were comparable to those prevailing in New Mexico. 39/

In 1965, the Commissioner of Public Lands issued new regulations based on carrying capacity and economic conditions that again raised the minimum rental fee for livestock grazing in New Mexico.

The Commissioner retained the minimum 3 cents per acre for three head of cattle or less. From this base for each additional head the fee went up 1 cent per head. For example, the minimum rental fee for land having a carrying capacity of ten head per section, the rental per acre was 10 cents. The animal unit cost would be:

640 x 10¢ per acre = $64 per section
10 cows would cost $64 or
$6.40 per cow unit, or
$1.28 per sheep unit

38/ Sec. 7-8-30, N.M.S.A. (1962 Compilation).
39/ Rules and Regulations, State Land Office, Santa Fe, New Mexico (1965).

Summary of Grazing Fees

Year	Statutory Minimum Fee per acre	Minimum fee per acre with carrying capacity of 10 cows	Cost per cow unit per year (5 sheep = 1 cow)	A.U.M. (divide by 12)
1921	3¢ per acre	Let to highest bidder	Unknown	Unknown
1951	3¢ per acre	4¢ per acre ($25.60 per section)	$2.56 per cow	21¢
1961	3¢ per acre	8¢ per acre ($51.20 per section)	$5.10 per cow	42¢
1965	3¢ per acre	10¢ per acre ($64.00 per section)	$6.40 per cow	53¢

Minimum Rentals for Agricultural Lands

No statutes exist which sets minimum rental fees for the use of agricultural lands. However, in the 1960-1961 study conducted by the State Land Department, the minimum fee set by the Commissioner of Public Lands was 25 cents per acre with a maximum fee of $2 per acre.

In 1965 Regulations issued by the Commissioner of Public Lands the minimum rates were raised appreciably to the following rates:

Dry farming lands - Fifty (50) cents per acre
Irrigated lands - Two (2) dollars per acre
Cotton lands - Four (4) dollars per acre

The Commissioner reserved the right to increase such minimum rentals in any case where the facts, conditions and circumstances so warrant. 40/

The Commissioner also provided that where there has been a conversion of irrigable or dry farming lands back to grazing there would be no reduction in rentals permitted for the balance of the unexpired term. Prior to the termination of the lease a field inspection will be made and if the land has been returned to its former and natural state for grazing a new lease may be had at the usual grazing fee rate and for the usual five-year term. 41/

Grazing and Agricultural Land Lease Income

Based on a study of the annual reports of the Commissioner of Public Lands for the fiscal years 1964 through 1968, the following information was obtained:

40/ Rule 13, Rules and Regulations, State Land Office (1965).
41/ Rule 14, Rules and Regulations, State Land Office (1965).

Total Grazing and Agricultural Lease Income

1964-65	$1,162,662.34
1965-66	1,201,576.87
1966-67	1,118,669.96
1967-68	1,141,490.78

Assuming that the total lands under grazing or agricultural use to be rather constant at 9,116,563 acres over the four-year period then the average income per acre was about 10.5 cents per acre.

In the fiscal year 1967-1968, state lands were devoted to irrigation, cotton and grazing in the following acreage:

Dry land farming	- 43,958.45 acres @ 50¢ per acre	$21,979.23
Irrigated lands	- 19,797.68 acres @ $2 per acre	39,595.36
Cotton farming	- 2,534.19 acres @ $4 per acre	10,136.76
Grazing lands	- 9,050,272.88 acres	1,040,719.49
	Total Income	$1,112,430.84

In all leases executed by the Commissioner of Public Lands for grazing and agricultural purposes there is specifically reserved by him the right to execute multiple leases and the right to grant easements across such lands as follows:

1. To execute leases for the above lands for mining purposes, the extraction of petroleum, natural gas, salt and other deposits therefrom, and the right to sell and dispose of them, and

2. To execute grants of rights-of-way and easements, over and across or upon the lands embraced in this lease for public highways, railroads, trainways, telegraph, telephone and power lines, irrigation works, mining, logging, pipe line, business leases, water leases and other purposes.

The lessee is left to bargain for and settle all damage claims occasioned by multiple leases or the owner or users of the several easements and rights-of-way.

Security of Tenure -- Improvements on Grazing and Agricultural Lands

The security of a lessee's tenure is closely allied with his right to renew his lease, make, retain or to be compensated for improvements placed by him on the leased premises. The lessee has a qualified right to renew his lease by meeting any qualified bid submitted by third persons. 42/

42/ Sec. 7-8-51, N.M.S.A. (1962 Compilation); Rule 6, Rules and Regulations, State Land Office (1965).

Although the State Land Board assumes no responsibility for the cost of making any improvements on state lands leased for grazing or agricultural purposes, it does permit their construction under certain specified restrictions. 43/

Thus, the holder of a grazing lease upon state lands is limited, unless written permission is first obtained from the Commissioner, to improvements upon said lands as follows: Fences not to exceed $150 per mile and necessary corrals, at a cost not exceeding $200. 44/

When an agricultural lease is involved, the holder of such lease, unless written consent is first obtained from the Commissioner, is limited to improvements upon such land as follows: Exterior fences not to exceed $150 per mile; inside cross fences not to exceed $75 per mile; barns, dwellings and all other buildings not to exceed $1000; and for improvements to the land, such as orchards, plowed lands, crops and the like, the amount allowed shall be only the amount added to the natural value of the land by such improvements, but in no case to exceed a total of $10 per acre for land actually so improved. 45/

For the purposes herein before set out, fences and growing crops shall be considered as movable improvements while all other improvements are termed permanent improvements. 46/

The lessee has several alternatives upon the termination of his lease:

1. If the lessee has kept his improvements within the restrictions set out above, or

2. If the improvements exceed the restrictions set out above and the lessee has obtained the written permission of the Commissioner in advance of their construction, then the lessee may remove the movable improvements, including the excess improvements, but he may not remove the permanent improvements whether within or beyond the limits set by statute. 47/

The lessee is, however, entitled to compensation from subsequent purchases and lessees of the lands upon which he has placed and left improvements that are within the statutory limits, or, if in excess of the statutory limits, he has obtained the prior written consent of the Commissioner to make such excess improvements. 48/ However, if lessee has not complied with the statutes and regulations, he will forfeit all right to receive compensation for the permanent improvements.

43/ Sec. 7-8-53, N.M.S.A. (1962 Compilation); Rules 31-36, Rules and Regulations, State Land Office (1965).
44/ Ibid.
45/ Ibid.
46/ Sec. 7-8-53, N.M.S.A. (1962 Compilation).
47/ Id.
48/ Sec. 7-8-60, 7-8-19.1, N.M.S.A. (1962 Compilation).

in the event possession is lost by him through subsequent sale or adverse bid. 49/

The enforcement of the above forfeiture rules presented a problem to the Commissioner of Public Lands. Most lessees faced with a forfeiture of their right to claim compensation for excess improvements alleged that they were not aware of the statutes and regulations imposing such forfeitures and the necessity of obtaining the written permission of the Commissioner before making the improvements. The Commissioner provided the following exception for improvements made prior to March 1, 1952, without his prior written permission, by providing that a lessee "shall be compensated therefore, by a subsequent purchaser or lessee, in an amount to be determined by an appraisal made by the Commissioner. Any person in interest aggrieved by the Commissioner's appraisal may appeal to the district court, as provided by law." 50/

Lessees under grazing or agricultural leases of state lands are relatively secure in their tenure. Section 7-8-37, N.M.S.A., 1962 Compilation, provides that such leases cannot be cancelled or forfeited before the expiration of the full term thereof by the Commissioner of Public Lands without the written consent of the lessee, except for fraud, collusion, mutual mistake or default of the lessee. In such cases the Commissioner shall serve upon the lessee a notice of default, in writing by registered mail, to show cause before him, upon a date to be fixed in the notice, why such instrument should not be cancelled. 51/

All sales of state land embraced within such lease are subject to all the terms and provisions thereof except the right of the lessee to a renewal of the lease at the end of the term. 52/

The 1962 Compilation of New Mexico statutes at Section 7-8-52 also provides that the Commissioner of Public Lands may cancel any grazing or agricultural leases executed by him where there has been a violation of any of the terms, convenants or conditions of such lease or by the failure of the lessee to make payments of rents then due.

However, if within the thirty (30) days the party or parties in interest shall comply with the demand in the notice, cancellation shall not be made. In cases where rentals are delinquent, the Commissioner may, at his option, look to the lessee or his sureties and/or his lien upon improvements for payment rather than cancel the lease. 53/

49/ Id. Rule 33.
50/ Rule 35, Rules and Regulations, State Land Office (1965).
51/ Rule 25, Rules and Regulations, State Land Office (1965).
52/ Sec. 7-8-37, N.M.S.A. (1962 Compilation).
53/ Sec. 7-8-8, N.M.S.A. (1962 Compilation).

In this connection, Section 7-8-36, N.M.S.A., 1962 Compilation, provides that rentals shall constitute a first lien on any and all improvements and crops upon the land without exception. Failure to pay the rentals when due or to furnish additional security for any deferred payment, when required by the Commissioner, shall be sufficient cause for declaring such lease forfeited.

Sub-leasing

The sub-leasing of state lands by the lessee, whether verbal or in writing, is expressly prohibited without the written consent of the Commissioner, which shall be limited to the balance of the current term of the base lease then in effect. 54/ The application for a sub-lease must be accompanied by a fee equal to 20 percent of the unearned rentals under the base lease and a statement of the full consideration paid for the sub-lease under oath.

A sub-lease also results when the use of state land under lease is exchanged for the use of lands owned or leased by a third party. 55/

Relinquishment, Transfer and Assignment of Leases

The assignment of leases of state lands for grazing and agricultural purposes may take a variety of forms:

1. The lessee, with consent of the Commissioner, may relinquish all or any part of his lease to the state and recover all unearned rentals and notes given in security of payments on the lease. 56/

2. The lessee may assign his lease in whole or in part to third persons with the consent of the Commissioner. Forms are furnished by the State Land Office for the purpose of assignment. Among other matters to be stated, the lessee, under oath, must make a true statement of what consideration, if any other than the payment, for improvement, has been paid or has been promised the holder for said lease. The Commissioner may refuse to approve any assignment not presented for his approval within 90 days of its actual execution date. 57/

54/ Rule 17, Rules and Regulations, State Land Office (1965).
55/ Rule 18, Rules and Regulations, State Land Office (1965).
56/ Rule 19, Rules and Regulations, State Land Office (1965).
57/ Rule 20, Rules and Regulations, State Land Office (1965).

3. A lessee may also make an assignment of his lease as collateral security, with the consent of the Commissioner and upon such forms as he shall subscribe. The assignment shall not be approved by the Commissioner until all delinquent payments on the lease have been made nor shall the consent to the assignment prevent the Commissioner from cancelling any lease so assigned for failure to make further rental payments for non-compliance with the terms and conditions of the lease. 58/

Collateral assignments may be foreclosed in the same manner as provided for by law with respect to chattel mortgages. The purchaser at the sale may, if qualified, be given a new lease upon the filing of the transfer papers and the payment of delinquent rentals, if any. 59/

The assignee has the duty to file a release upon a form prescribed by the Commissioner when the debt has been fully satisfied. Failure to do so will subject the assignee to both criminal and civil liability for the cost of clearing title. 60/

Lessee's Duty to Protect Land Against Waste or Trespass

The lessee of state lands is charged with the duty to protect the lands leased by him from waste or trespass by unauthorized persons. Failure to do so subjects his lease to cancellation or forfeiture. 61/

Cooperation with State Agencies - Wildlife, Parks, State Game Commission

The Commissioner of Public Lands granted a five-year easement to the State Game Commission on March 14, 1961, over all state grazing and agricultural leases or a period of five years at an annual consideration of one-half cent per acre per annum. This easement has been renewed for another five years to March 14, 1971. 62/

The easement provided that it was the intent of the instrument to grant the State Game Commission the unrestricted right to enter upon such lands for the purpose of managing, propagating and harvesting all wildlife and fish thereon, subject only to the right of other lessees to carry on their lawful activities.

58/ Rule 27, Rules and Regulations, State Land Office (1965).
59/ Rule 29, Rules and Regulations, State Land Office (1965).
60/ Rule 30, Rules and Regulations, State Land Office (1965).
61/ Sec. 7-7-5, N.M.S.A. (1962 Compilation).
62/ Records Office, State Land Commission (1968).

Any permittee of the Game Commission is liable for any damage to the property of a lessee lawfully upon the premises.

The Game Commission is further authorized to make rules and regulations for the exercise of hunting and fishing rights herein granted and to enter into agreements with other lessees and land owners for the purpose of establishing and maintaining the most beneficial game management units on the lands herein granted.

Park Commission

The Commissioner has cooperated with the Park Department by refusing to lease state lands for mineral exploration and development in the Rio Grande Park without first obtaining the consent of the Park Commission. This action will greatly enhance the scenic beauty of the area as well as assist in preventing soil erosion and pollution of streams.

Three leases have been executed with the Park Department covering park sites for which the rent is quite nominal.

Leasing of state lands for county and city parks is quite customary. The Commission is required by Section 10 of the Organic Act of 1850, 9 Stat. 484, to charge a rental fee commensurate with the value of the land. Thus, the Highway Department must pay for rights-of-way over and materials taken from state lands in the construction of highways. 63/

Forest Service

The Forest Service handles all of the fire protection work on state forest lands and supervision of all timber sales therefrom.

63/ State v. Walker, GIM.M.374, 301 p. 2d 317 (1956).

SECTION B

STATE TAXATION OF POSSESSORY INTERESTS IN GRAZING PERMITS AND LEASES

Developments in state taxation of possessory interests in grazing permits and leases are affecting western ranchers who graze on the public domain. The states are initiating assessment of a tax based upon the value of the possessory interest of the permittee who grazes on public lands.

While states are forbidden from taxing the federal government, the interest created by virtue of the right to graze on the public land is subject to taxation. 1/

The Supreme Court of Oregon in Sproul v. Gilbert, 2/ upheld taxation of the possessory interests created by a Taylor Grazing Act Section 15 grazing lease. The tax was authorized by ORS 307.060 which provided in pertinent part:

> "Real and personal property of the United States or any department or agency thereof held by any person under a lease or other interest or estate less than a fee simple, other than under a contract of sale, shall be assessed and taxed as for the full true cash value thereof subject only to deductions for restricted use ..."

Subsequent to this decision the Oregon Legislature amended ORS 307.060 to provide that this section "... shall not apply to real property held or occupied primarily for purposes of grazing livestock ..." 3/

The states of California and Washington have in effect, however, authority which provides for taxation of the possessory interest. In February, 1967, the California State Board of Equalization effectuated "Board of Equalization Rule No. 126" which provides that:

> "The possession of, claim to, or right to the possession of publicly owned land for grazing livestock or raising forage is a taxable possessory interest. Fences, wells, reservoirs, and other improvements constructed on such land for the care and the management of the livestock are taxable possessory interests."

It is the policy of the State Board of Equalization that all rights to graze on the federal range, both Bureau of Land Management and

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1/ Sproul v. Gilbert, 226 or 392, 359 p. 2d 543 (1961).
2/ Id.
3/ ORS 307.060.

U.S. Forest Service, are taxable possessory interests regardless of the means of conveyance. Grazing rights on other tax exempt lands, whether owned by federal, state or other governmental agencies, also constitute possessory interests. 4/

The assessments are made by the county assessors. It is recommended to the assessors that they capitalize economic rents to obtain the best estimate of the market value of a grazing permit. The guideline procedures forwarded to the county assessors by the State Board of Equalization provides in pertinent part:

"... Many rights to graze cattle are granted by the U.S. Bureau of Land Management and the U.S. Forest Service under documents labeled 'licenses,' 'permits,' 'annual permits-' and 'term permits,' as well as leases. Whatever the document label, a taxable possessory interest exists whenever a privately held estate in real property owned by a tax-exempt agency exists on the lien date. While physical possession is not a prerequisite, the right to possession must exist on the lien date.

"Having determined that a possessory interest exists on the lien date, the assessor estimates the economic rent per animal-unit-month (AUM) and applies it to the number of AUM's involved (or if not specified, to the estimated carrying capacity of the right possessed) and capitalizes the annual earning capacity for the number of years the rights are anticipated to be held. An illustration of this process, if we assume an economic rent of $3 per AUM for a right to graze 1,500 AUM over a period of 10 years at a capitalization rate of 8% is"

(Economic rent per AUM) times (Number of AUM's) times (Factor for constant income for n years at given capitalization rate) = Value of possessory interest, or for example, $3 x 1,500 x 6.71 = $30,195.*

Use of these figures for yield, rate, and economic rent is for illustrative purposes and does not constitute a recommendation.

"In estimating the economic rent, the assessor may look first to the contract rent since this is usually set with reference to the state of the livestock market. But the contract rent is seldom established in a competitive market, so the assessor must often look to rents paid for

4/ Letter from Ronald B. Welch, Assistant Executive Secretary, State of California, July 22, 1968.

comparable grazing rights to private landowners in order to test whether the contract rent is the full economic rent. In making this comparison, the assessor should be aware that grazing rights on public lands are often characterized by poor access, a trucking expense, interference by persons using the land for purposes other than grazing, and possibly a higher animal mortality rate occasioned by lack of protection. The estimated economic rent should reflect all characteristics of the grazing rights on public lands that differ from the grazing rights on private lands which are used as comparables.

"Often the possessory interest is shared by more than one grazer. The value of each grazer's possessory interest is appropriately appraised by using the number of AUM's he is permitted. The appraisal, assessment, and billing of each grazer's possessory interest is essentially an allocation of the total permitted rights.

"The assessor must select a capitalization rate with the realization that a rate obtained from sales of fee-owned property may embody the expectation of a capital gain that is absent in the possessory interest. The rate selected should be high enough to allow for "risk and hazard," unless a separate discount for risk and hazard is allowed." 5/

In Washington the leasehold value created by an economic advantage in rent paid is taxable. 6/ In explanation, the Washington "land Appraisal Manual" provides that:

"United States Forest Service (USFS), Bureau of Land Management (BLM) and other public owned lands, constitute a large portion of some Washington counties. The majority of these lands are leased for the grazing of livestock on a permit basis, and generally speaking, the contract rent is lower than the economic rent. The difference between contract rent and economic rent constitutes a leasehold interest, the value of which is taxable under Washington law: RCW 84.40.030, page 110 Annotated Property Tax Code, 1955."

5/ Letter from Jack F. Eisenlauer, Chief, Assessment Standards Division, California State Board of Equalization, to California County Assessors, April 21, 1967.

6/ Washington Department of Revenue, "Land Appraisal Manual," p. 67; RCW 84.40.030.

As with the state of California, the appraisal is done by the county assessors. Taxes collected annually are slightly less than $6,000. The total tax collections to July 1, 1966 (fiscal year 1967) were $5,817.47; total collections to July 1, 1967 (fiscal year 1968) were $5,698.01. 7/

The states of Oregon, Colorado, Arizona, Montana, Nevada, Idaho and Wyoming do not tax the possessory interest created by grazing on public lands. 8/

7/ Letter from T.S. Cady, Administrative Assistant, Department of Revenue, State of Washington, July 5, 1968.
8/ Respective state attorney generals and taxing authorities.

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TABLE VII-1

GRAZING LANDS ADMINISTERED BY FEDERAL AGENCIES

Agency	Total Area Administered a/	Administered Exclusive of Alaska b/	Area Grazed b/	Grazed Area as Percent of Total Area Administered	Grazed Area as Percent of Area Administered Exclusive of Alaska
	(1,000 Acres)			(Percent)	
U.S. Forest Service	186,500	165,700	105,400	56.6	63.6
National Park Service	22,900	16,000	1,360	5.9	8.5
Bureau of Land Management	480,000	175,000	157,300	32.8	89.9
Bureau of Sport Fisheries and Wildlife	27,100	8,490	2,410	8.9	28.3
Bureau of Reclamation	9,020	9,010	3,660	40.6	40.6
Bureau of Indian Affairs	4,940	870	800	15.4	87.3
Department of Defense	30,500	27,900	2,680	8.8	9.6
Atomic Energy Commission	2,150	2,150	c/ 200	10.1	10.1
TOTAL	763,051	405,100	273,600	35.9	67.5

a/ Source: United States Department of the Interior, Bureau of Land Management. 1967. Public Land Statistics. Superintendent of Documents. Washington, D.C. Table 9.

b/ Source: Tables supplied by PLLRC. Data includes National Grasslands and Land Utilization Projects.

c/ Grazing administered by Bureau of Land Management and this acreage is also included with Bureau of Land Management acreage grazed.

TABLE VII-2

LAND a/ ALLOCATED FOR GRAZING IN EACH STATE, BY AGENCY AND KIND OF ANIMAL

State	Cattle and Horses								Sheep and Goats								Total							
	USFG b/		BLM		All Agencies				USFG b/		BLM		All Agencies				USFG b/		BLM		All Agencies			
	C&H	S&G	C&H	S&G	C&H	S&G	C&H	S&G	C&H	S&G	C&H	S&G	C&H	S&G	C&H	S&G	C&H	S&G	C&H	S&G	C&H	S&G	C&H	S&G
			(1,000)						(1,000)															
Montana	4,791.5	0	6,664.4	0	11,455.9	0	34.7	34.7	1,124.0	19.0	7.2	1.0	1,131.2	4.0	2,037.3	4.0	7,672.4	0	7,788.6	79.8	15,461.0	79.8	49.7	83.0
Idaho	4,913.2	0	6,809.0	78.9	11,722.2	78.9	128.2	8.4	1,580.0	0	122.0	1.0	1,702.0	1.0	3,544.4	1.0	11,822.4	0	15,590.0	34.0	27,412.4	34.0	128.0	7.0
Wyoming	4,267.3	36.1	5,396.0	1.0	9,663.3	37.1	394.2	1.0	2,342.0	0	444.3	0	2,786.3	0	4,128.4	0	10,609.3	36.1	5,840.0	1.0	16,449.3	37.1	522.5	1.0
Colorado	7,291.2	0.4	11,470.0	2.0	18,761.2	2.4	90.3	49.2	4,176.7	1.4	34.3	0	4,211.0	1.4	4,410.4	1.0	11,468.0	107.1	7,758.0	1.0	19,226.0	108.1	124.5	50.2
New Mexico	10,486.0	843.1	11,243.0	404.0	21,729.0	1,247.1	180.0	1.0	2,575.0	0	14.3	214.0	2,589.3	214.0	1,342.1	0	13,061.0	0.4	11,257.0	214.0	24,318.0	214.4	194.3	215.0
Arizona	4,146.0	111.1	10,243.0	0	14,389.0	111.1	220.0	0	1,009.0	0	22.0	0	1,031.0	0	1,042.1	0	5,155.0	111.1	10,265.0	0	15,420.0	111.1	242.0	0
Utah	3,236.7	0	10,243.0	134.0	13,479.7	134.0	112.0	0	2,152.1	72.4	6,865.0	0	9,017.1	72.4	11,194.7	0	7,388.7	194.0	21,108.0	134.0	28,496.7	328.0	112.0	0
Nevada	3,432.4	0	7,154.0	0	10,586.4	0	164.4	0	799.2	0	7,154.0	0	7,953.2	0	4,231.6	0	4,863.3	0	14,308.0	0	19,171.3	0	164.4	0
Washington	1,152.0	0	4,300.0	0	5,452.0	0	94.2	0	2,317.0	0	570.0	0	2,887.0	0	1,411.2	0	3,469.0	0	4,870.0	0	8,339.0	0	94.2	0
Oregon	10,488.2	7.3	13,018.0	23.0	23,506.2	30.3	34.2	4.0	1,234.4	11.1	1,257.0	19.0	2,491.4	30.1	2,086.2	0	9,455.4	7.3	13,675.0	23.0	23,130.4	30.3	34.2	4.0
California																	11,943.6	19.1	6,422.0	42.0	18,365.6	61.1	128.4	6.0
11 Western States	73,411.9	1,108.9	121,244.4	1,996.0	194,656.3	3,104.9	1,262.2	164.0	21,343.8	130.2	35,947.0	42.0	57,290.8	172.2	50,136.9	301.3	96,455.7	1,239.1	157,211.4	2,096.0	253,667.1	3,335.3	1,390.2	206.0
Other States	8,792.2	116.8	78.0	271.0	8,870.2	387.8	34.3	379.0	1,375.8	11,047.2	81.4	0	14.0	0	1.5	0	4.2	101.1	8,783.6	116.8	92.0	371.0	35.8	379.0
United States	82,204.1	1,225.7	121,322.4	2,267.0	203,526.5	3,492.7	1,296.5	543.0	22,719.6	11,177.4	36,028.4	42.0	57,304.8	172.2	50,138.4	301.3	105,439.3	1,340.2	165,995.0	2,212.8	271,434.3	3,706.3	1,426.0	585.0
% 11 Western States are of U.S.	89.6	90.5	99.9	84.3	95.6	88.9	97.3	30.2	93.9	1.2	99.8	2.4	99.9	7.8	99.9	16.7	91.4	92.4	94.7	94.7	93.5	90.0	97.5	35.4

a/ 1966. Source: Information supplied to the PLLRC by the various agencies.
b/ Includes National Grasslands and Land Utilization Projects.

TABLE VII-4

PERCENT OF TOTAL PUBLIC LAND ALLOCATED FOR GRAZING THAT WAS GRAZED BY CATTLE AND HORSES, AND BY SHEEP AND GOATS a/
1966

State	USFG b/		BLM c/		All Agencies	
	C&H	S&G	C&H	S&G	C&H	S&G
Montana	88	12	86	14	88	12
Idaho	58	42	69	31	64	36
Wyoming	63	37	50	50	54	46
Colorado	66	34	69	37	68	32
New Mexico	94	6	85	15	88	12
Arizona	93	7	98	2	96	4
Utah	68	32	58	42	60	40
Nevada	81	19	83	17	83	17
Washington	82	18	97	3	82	18
Oregon	77	23	95	5	88	12
California	89	11	85	15	87	13
11 Western States	78	22	77	23	78	22
Other States	99	1	85	15	99	1
United States	80	20	77	23	78	22

a/ Source: Compiled from data supplied to the PLLRC by the various agencies for 1966.
b/ Includes National Grasslands and Land Utilization Projects.
c/ Includes Land Utilization Projects.

TABLE VII-5

SUMMARY OF LAND ALLOCATED FOR GRAZING BY AGENCY, SEASON OF USE AND KIND OF DOMESTIC ANIMAL, 1968

(1,000 Acres)

	Cattle and Horses						Sheep and Goats						All Animals					
	Spring Fall	Spring Summer	Summer	Winter	Year-Long	Sub-Total	Spring Fall	Spring Summer	Summer	Winter	Year-Long	Sub-Total	Spring Fall	Spring Summer	Summer	Winter	Year-Long	Total
USFS[a]																		
Eleven Western	1,865	3,548	55,371	3,332	11,240	75,457	582	409	19,708	448	91	21,238	2,547	3,957	75,079	3,780	11,331	96,694
Other States	230	2,173	3,524	181	2,721	8,810	0	10	73	1	3	87	230	2,183	3,597	182	2,724	8,897
United States	2,196	5,721	58,895	3,493	13,962	84,267	582	419	19,781	449	94	21,325	2,778	6,140	78,676	3,942	14,055	105,592
Percent	2.6	6.8	69.9	4.1	16.6	100.0	2.7	2.0	92.8	2.1	0.4	100.0	2.6	5.8	74.5	3.7	13.3	100.0
BLM																		
Eleven Western	26,283	24,690	11,464	20,189	38,611	121,237	10,998	3,930	2,820	15,859	2,661	36,268	37,281	28,620	14,284	35,748	41,272	157,205
Other States	10	20	3	4	41	78	4	8	0	0	2	14	14	28	3	4	43	92
United States	26,293	24,710	11,467	20,193	38,652	121,315	11,002	3,938	2,820	15,859	2,663	36,282	37,295	28,648	14,287	35,752	41,315	157,297
Percent	21.7	20.4	9.4	16.6	31.9	100.0	30.8	10.9	7.8	43.2	7.4	100.0	23.7	18.2	9.1	22.7	26.3	100.0
DOD																		
Eleven Western	135	56	90	356	405	1,041	52	8	27	175	4	265	186	64	118	531	409	1,306
Other States	100	51	9	41	1,181	1,382	0	0	0	48	0	48	100	51	9	90	1,181	1,431
United States	235	107	99	397	1,586	2,423	52	8	27	224	4	314	286	115	125	621	1,590	2,737
Percent	9.7	4.4	4.1	16.4	65.4	100.0	16.4	2.5	8.5	71.3	1.3	100.0	10.4	4.2	4.6	22.7	58.1	100.0
NPS																		
Eleven Western	41	0	136	165	695	1,038	1	0	12	114	3	130	42	0	148	279	698	1,168
Other States	0	0	1	0	116	117	0	0	0	0	0	0	0	0	0	0	116	117
United States	41	0	137	165	812	1,154	1	0	12	114	3	130	42	0	148	279	814	1,284
Percent	3.6	.0	11.8	14.3	70.3	100.0	0.8	.0	9.6	87.4	2.2	100.0	3.3	.0	11.6	21.7	63.4	100.0
BSFW																		
Eleven Western	890	278	348	257	414	1,985	1	30	9	2	0	42	891	308	355	259	414	2,027
Other States	89	20	104	77	75	365	6	0	0	0	0	6	95	20	104	77	75	371
United States	779	298	452	334	489	2,350	7	30	9	2	0	48	786	328	459	336	489	2,398
Percent	33.1	12.7	19.1	14.2	20.8	100.0	14.6	62.5	18.8	4.2	.0	100.0	32.8	13.7	19.1	14.0	20.4	100.0
BR																		
Eleven Western	445	476	258	825	397	2,401	272	110	98	735	35	1,250	717	587	357	1,559	432	3,651
Other States	3	5	12	0	6	26	0	0	2	1	0	2	3	5	13	1	6	28
United States	448	482	269	825	403	2,426	272	110	101	735	35	1,253	720	592	370	1,560	438	3,679
Percent	18.4	19.8	11.1	34.0	16.6	100.0	21.7	8.8	8.0	58.7	2.8	100.0	19.6	16.1	10.0	42.4	11.9	100.0
BIA																		
Eleven Western	0	55	34	1	70	160	1	1	1	0	214	217	1	56	35	1	284	377
Other States	0	0	0	0	343	343	0	0	0	0	0	0	0	0	0	0	343	343
United States	0	55	34	1	413	503	1	1	1	0	214	217	1	56	35	1	627	720
Percent	.0	10.9	6.7	0.2	82.1	100.0	0.5	0.5	0.5	.0	98.6	100.0	0.1	7.8	4.9	0.1	87.1	100.0
TOTAL																		
Eleven Western	29,559	29,103	67,000	25,125	51,833	203,318	11,906	4,468	22,676	17,032	3,007	59,111	41,465	33,562	90,375	42,157	54,840	262,428
Other States	432	2,269	3,652	283	4,484	11,121	10	18	74	50	5	158	442	2,286	3,727	333	4,488	11,279
United States	29,991	31,373	71,264	25,408	56,316	214,436	11,916	4,506	22,751	17,083	3,012	59,269	41,907	35,879	94,102	42,491	59,328	273,707
Percent	14.0	14.6	33.3	11.8	26.3	100.0	20.1	7.6	38.4	28.8	5.1	100.0	15.3	13.1	34.4	15.5	21.7	100.0

a/ Includes National Grasslands and Land Utilization Project Areas.

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TABLE XII-6

ACREAGE OF LAND ALLOCATED FOR GRAZING BY THE U. S. FOREST SERVICE AND BUREAU OF LAND MANAGEMENT
BY SEASON OF USE AND KIND OF DOMESTIC ANIMAL
ELEVEN WESTERN STATES, 1966.

U. S. Forest Service 1/ (1,000 Acres)

	Cattle and Horses						Sheep and Goats						All Animals					
	Spring Fall	Spring Summer	Summer	Winter	Year-Long	Total	Spring Fall	Spring Summer	Summer	Winter	Year-Long	Total	Spring Fall	Spring Summer	Summer	Winter	Year-Long	Total
Montana	47	86	6,983	12	8	6,795	3	0	868	11	0	882	50	68	7,531	23	8	7,677
Idaho	241	292	8,333	47	0	6,913	37	150	4,557	133	33	4,909	278	442	10,890	180	33	11,823
Wyoming	0	40	4,081	83	0	4,184	33	6	2,441	62	0	2,542	33	46	6,502	145	0	6,726
Colorado	247	5	7,799	34	139	8,224	37	0	4,140	0	0	4,177	284	5	11,938	34	139	12,401
New Mexico	413	565	2,413	499	4,058	7,950	64	0	267	71	58	460	478	565	2,680	570	4,117	8,410
Arizona	400	129	2,550	2,112	5,496	10,677	182	0	540	0	0	732	582	129	3,090	2,112	5,496	11,409
Utah	14	199	4,730	27	0	4,971	18	50	2,182	18	0	2,252	24	150	6,912	37	0	7,123
Nevada	119	36	3,429	298	54	3,925	81	15	854	19	0	969	180	50	4,282	318	53	4,894
Washington	0	63	3,233	0	340	3,636	0	46	734	0	0	780	0	109	3,967	0	340	4,416
Oregon	176	362	6,408	83	678	7,850	33	78	1,984	141	0	2,217	262	381	8,372	234	678	9,867
California	324	1,980	7,782	108	487	10,632	122	71	1,142	0	0	1,344	446	2,051	8,924	108	487	11,996
11 Western States	1,985	3,948	55,371	3,332	11,240	75,467	582	409	19,708	448	91	21,238	2,547	3,957	75,079	3,780	11,331	96,694
Other States	230	2,173	3,524	181	2,721	8,910	0	10	73	1	3	87	230	2,183	3,597	182	2,724	8,997
United States	2,196	5,721	58,895	3,493	13,962	84,286	582	419	19,781	449	94	21,325	2,778	6,140	78,676	3,942	14,055	105,582

1/ Includes National Grasslands and Land Utilization Project Areas.

TABLE XII-6 (CONT.)

Bureau of Land Management (1,000 Acres)

	Cattle and Horses						Sheep and Goats						All Animals					
	Spring Fall	Spring Summer	Summer	Winter	Year-Long	Total	Spring Fall	Spring Summer	Summer	Winter	Year-Long	Total	Spring Fall	Spring Summer	Summer	Winter	Year-Long	Total
Montana	2,439	2,111	881	268	946	6,680	246	262	107	231	278	1,124	2,684	2,373	988	520	1,219	7,794
Idaho	3,756	3,389	704	90	61	8,009	2,422	457	188	514	0	3,581	6,178	3,846	892	613	61	11,590
Wyoming	3,360	1,739	1,291	1,941	375	8,706	3,612	1,186	682	2,735	385	8,580	6,972	2,905	1,973	4,676	760	17,286
Colorado	1,890	1,305	853	1,145	190	5,383	853	106	280	1,085	51	2,375	2,743	1,411	1,133	2,230	241	7,758
New Mexico	354	138	0	410	10,572	11,472	167	67	0	192	1,624	2,050	521	203	0	602	12,196	13,522
Arizona	1,906	0	273	2,305	7,669	12,243	99	0	0	124	0	233	2,005	0	273	2,429	7,669	12,476
Utah	2,563	1,439	2,906	4,799	564	12,241	1,535	194	135	7,001	0	8,865	4,098	1,633	3,041	11,770	564	21,106
Nevada	4,920	6,622	2,344	7,887	14,782	35,965	1,222	994	1,236	3,465	317	7,236	6,142	7,616	3,582	11,352	15,099	43,201
Washington	55	78	31	24	30	218	7	0	0	0	0	7	62	78	31	24	30	223
Oregon	3,795	6,646	1,827	1,016	4	13,187	552	26	17	75	0	670	4,347	6,671	1,844	1,091	4	13,857
California	1,156	1,928	354	294	3,424	7,156	284	658	173	137	5	1,257	1,439	2,586	527	431	3,429	8,412
11 Western States	26,283	24,890	11,484	20,189	38,611	121,237	10,998	3,930	2,820	15,559	2,661	35,968	37,281	28,820	14,284	35,748	41,272	157,205
Other States	10	20	3	4	41	78	4	8	0	0	2	14	14	28	3	4	43	92
United States	26,293	24,710	11,487	20,193	38,652	121,315	11,002	3,938	2,820	15,559	2,663	35,982	37,295	28,848	14,287	35,752	41,315	157,297

TABLE VII-11

PERCENTAGE OF LAND ADMINISTERED FOR GRAZING
BY THE UNITED STATES FOREST SERVICE AND THE BUREAU OF LAND MANAGEMENT
IN FOUR RANGE CONDITION CLASSES, 1966

State	USFS a/				BLM			
	Excellent	Good	Fair	Poor	Excellent	Good	Fair	Poor
Montana	1.9	50.5	37.9	9.7	3.0	46.0	43.5	7.4
Idaho	17.5	20.6	41.7	20.2	2.7	20.7	51.9	24.7
Wyoming	5.4	14.0	52.6	28.0	2.0	17.4	51.0	29.5
Colorado	0.4	11.5	40.0	48.1	2.4	27.7	40.4	29.6
New Mexico	0.0	10.0	61.4	28.6	3.4	21.8	57.6	17.3
Arizona	0.0	8.0	55.3	36.7	2.7	20.7	51.9	24.7
Utah	5.7	20.8	43.6	29.9	1.0	3.9	49.2	45.9
Nevada	2.2	21.7	45.9	30.1	2.0	14.6	56.6	26.8
Washington	7.3	26.4	43.2	23.1	4.6	22.4	41.0	31.9
Oregon	1.6	16.3	30.5	51.5	3.6	12.6	41.1	42.6
California	1.6	4.3	26.2	67.9	0.5	15.0	56.3	28.1
11 Western States	2.9	15.7	44.1	37.2	2.2	16.7	51.6	29.5
Other States	0.4	30.4	41.8	27.2	0.5	12.8	59.7	27.0
United States	2.5	17.9	43.7	35.7	2.0	16.4	52.2	29.3

a/ Percentages are based only on land classified as suitable for grazing.

TABLE VII-12

PUBLIC LAND FROM WHICH GRAZING HAS BEEN EXCLUDED
FOR OTHER USES: WATERSHED, WILDLIFE, RECREATION
AND DISPOSAL, 1966 a/

	USFS	NPS	BLM	BSFW	BR	DOD	TOTAL
		(1,000 acres)					
Montana	478.51	1,153.30	46.15	118.0	24.4	37.0	1,857.36
Idaho	1,045.16	84.80	15.00	.0	102.5	.0	1,247.46
Wyoming	408.80	2,278.56	30.00	2.0	19.7	7.0	2,746.06
Colorado	1,344.77	419.80	99.04	3.0	20.6	.0	1,887.21
New Mexico	646.67	239.90	208.00	12.0	21.8	1.0	1,129.37
Arizona	296.93	935.10	277.00	306.0	1.0	5.0	1,821.03
Utah	628.06	511.30	184.00	2.0	7.2	.0	1,332.56
Nevada	137.42	116.90	.0	1,591.0	72.3	.5	1,918.12
Washington	148.92	1,136.19	.0	11.0	89.0	1.8	1,386.91
Oregon	426.29	160.82	14.17	45.0	23.6	2.5	672.38
California	971.66	4,079.10	95.0	115.0	340.0	1.3	5,602.06
11 Western States	6,533.19	11,115.77	968.36	2,205.0	722.1	56.1	21,600.52
Other States	177.39	11,054.19	1.4	137.0	91.4	587.2	12,048.58
Total U.S.	6,710.58	22,169.96	969.76	2,342.0	813.5	643.3	33,649.10

a/ Includes use for watershed protection, recreation, wildlife and land lost through land disposal laws.

TABLE XII-13

ACREAGE OF PUBLIC LAND FROM WHICH GRAZING HAS BEEN EXCLUDED FOR RECREATIONAL USE, ACREAGE OF PUBLIC LAND DESIGNATED FOR RECREATIONAL USE WHICH IS GRAZED BY DOMESTIC LIVESTOCK AND THE TOTAL ACREAGE OF PUBLIC LAND DESIGNATED FOR RECREATIONAL USE AS OF 1966.[a]

(1,000 Acres)

State	Acreage of Land From Which Grazing Has Been Excluded for Recreational Use						Acreage of Land Designated for Recreational Use Which Are Grazed by Livestock						Total					
	USFS	NPS	BLM	BR	DOD	TOTAL	USFS	NPS	BLM	BR	DOD	TOTAL	USFS	NPS	BLM	BR	DOD	TOTAL
Montana	185	1,153	0	3	0	1,321	696	0	19	0	0	695	831	1,153	19	3	0	2,006
Idaho	72	85	2	0	1	160	331	0	195	61	0	587	403	85	197	61	1	747
Wyoming	22	2,278	1	4	0	2,306	1,031	30	5	0	b/	1,066	1,053	2,308	6	4	b/	3,372
Colorado	168	420	0	4	0	592	525	108	0	0	0	653	693	528	0	4	0	1,225
New Mexico	50	240	1	12	0	303	668	b/	492	0	0	1,150	718	240	493	12	0	1,463
Arizona	88	935	0	0	0	1,023	685	0	0	0	0	685	773	935	0	0	0	1,708
Utah	162	511	8	7	0	688	119	49	7	507	0	682	281	560	15	514	0	1,371
Nevada	10	117	0	0	0	127	40	0	0	65	0	105	50	117	0	65	0	232
Washington	8	1,136	0	7	1	1,152	418	0	0	0	0	419	427	1,136	0	7	1	1,571
Oregon	26	161	0	11	2	200	565	0	1	0	0	566	611	161	1	11	2	786
California	488	4,078	2	0	0	4,548	543	19	5	0	19	586	1,011	4,098	7	0	19	5,135
11 Western States	1,239	11,118	15	48	4	12,422	5,612	206	724	633	19	7,194	6,851	11,322	739	681	23	19,616
Other States	106	11,054	1	78	306	11,543	8	911	0	0	134	1,051	112	11,965	1	78	440	12,594
United States	1,345	22,170	16	124	310	23,965	5,618	1,117	724	633	153	8,245	6,961	23,287	740	757	463	32,210
Percent 11 Western States is of U. S.	92.2	50.1	97.5	38.4	1.2	51.8	99.8	18.5	100.	100.	12.3	87.2	98.3	48.6	99.9	78.8	5.0	88.3

a/ Source: Information supplied to the Public Land Law Review Commission by the various Federal Agencies.

b/ Less than 0.5.

TABLE VII-14

PUBLIC LANDS LOST TO GRAZING
UNDER LAND DISPOSAL LAWS a/
1957-1966

	BLM b/	Reclamation	Defense	Total
		(1,000 acres)		
Montana		10.		10.
Idaho	3	100.2		103.2
Wyoming	5	6.1	6	17.1
Colorado		12.0		12.0
New Mexico	162		1	163
Arizona	3	1.0		4
Utah	120			120
Nevada		72.3		72.3
Washington		81.0		81.
Oregon	8	12.2		20.2
California	31	340.0		371.0
11 Western States	332	634.8	7	973.8
Other States	0	5.	1	6
United States	332	639.8	8	979.8

a/ The land disposal laws were the Desert Land Act and Homestead Act, Public Sales Act, Recreation and Public Purpose Act, and other land disposal laws.

b/ BLM includes Land Utilization, Public Domain, and Other Agency withdrawals.

TABLE VII-15

WITHDRAWALS OF PUBLIC GRAZING LAND FOR WATERSHED PROTECTION, RECREATIONAL USE AND WILDLIFE USE TO 1966

Agency	Watershed Protection	Recreational Use	Wildlife Use	Total	Percent
		(1,000 Acres)			
USFS	3,846	1,345	1,507	6,698	20
BLM	59	16	563	638	2
NPS		22,170		22,170	68
BSF&W			2,346	2,346	7
BR	4	124	46	174	1
DOD		310	319	629	2
Total	3,909	23,965	4,781	32,655	
Percent	12	73	15		100

The Impact of Mineral Exploration and Exploitation on Public Grazing Lands

Selection of Four Study Areas

At the outset of the study, considerable early planning was done in order to select the most satisfactory sample areas. The following statements relate to certain facts, guidelines and procedures that were used:

1. Prior to area selection and field inspection, maps of all kinds were located and by writing or calling were secured. These maps, in varying detail and scale, covered all of the areas in the Eleven Western States wherein, to some extent, mineral exploration and production existed on public grazing lands.

2. Additional and clarifying information, particularly about the nature and specific location of mining operations, was solicited through direct and indirect contacts. Contacts, in addition to private firms, included both state and federal agencies. It also included state mining associations, universities, and state mining bureaus.

3. It was learned early that a number of operations representative of the types under study existed in most of the areas reviewed; in other words, oil or gas operations would exist in the same area as mining claims and/or surface mining operations. Coal mining and phosphate operations, at least the larger ones, on the other hand appeared to be separate to some extent.

4. The four study areas were selected but boundaries were left for later determination. They are listed below:

   (a) Hard-Rock Mining - southwestern Colorado and southeastern Utah
   (b) Oil or Gas - northwestern New Mexico and adjoining states
   (c) Mining Claims - north central Nevada
   (d) Coal or Phosphate - southeastern Idaho and southwestern Wyoming

The general locations of these four areas are shown in Figure VII-1.

The selection of the areas was recommended to and approved by representatives of the Public Land Law Review Commission.

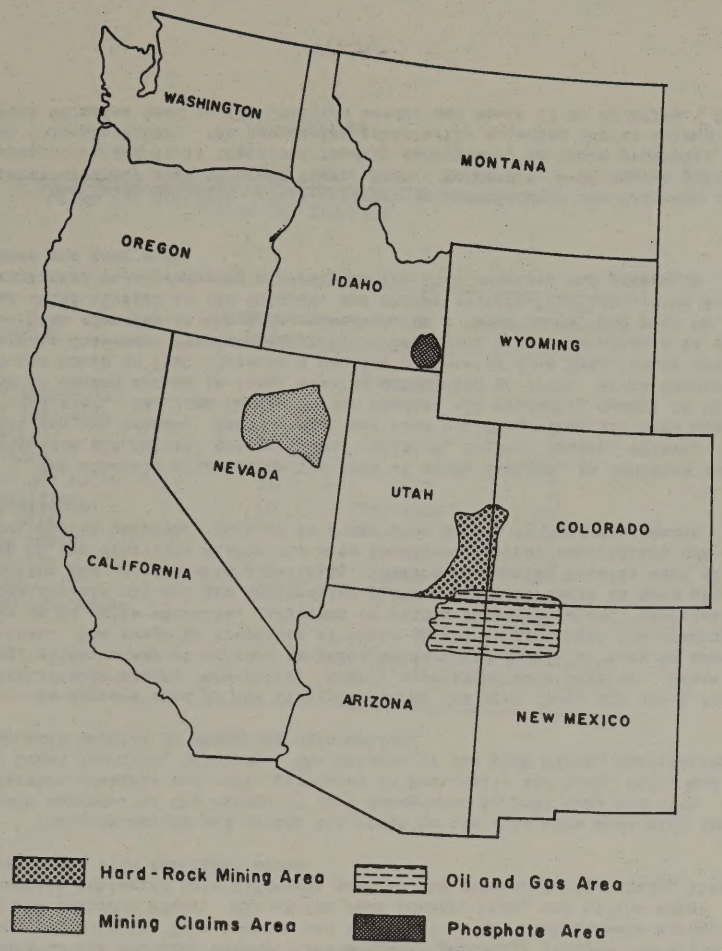

Figure VII-1 Approximate Locations of Four Mining Areas Studied.

5. Preparations were made to visit two of the areas during the summer of 1968, those identified above as (a) and (b), and the other two, (c) and (d) in the fall of 1968. These preparations involved contacts in the areas to be made during the visit.

6. It was determined that visit plans would be flexible in nature and subject to on-the-spot change if advisable.

7. It was believed that great benefit would result from a firsthand overall view of each area and from discussions with representative and knowledgeable persons there.

8. It was not believed that considerable detail would be necessary or useful in view of the spot areas selected without definite boundaries.

9. The existence and availability of adequate maps for all areas posed problems. Many public agencies such as the U.S. Geological Survey, the Bureau of Land Management, the U.S. Forest Service, the Army Mapping Service, the U.S. Soil Conservation Service, and others have excellent maps of certain areas. Private agencies such as the mining companies also have maps but these are most difficult to obtain. The maps, regardless of source, have two common failings: (1) they vary greatly in scale and in details shown and (2) they vary in age over a period of at least 50 years from very recent to quite old. Aerial mapping has become popular and economical during the past two decades and files of these maps in various locations provide excellent information. On the other hand, flights more than 5 years old generally do not accurately reflect conditions as they presently are.

Hard-Rock Mining Area

While there are extensive mining operations, both underground and surface, in many of the Eleven Western States, an area located largely in southeastern Utah and to some extent in western and southwestern Colorado was chosen for this part of the study. This area was the scene of considerable activities in uranium and vanadium mining in the early 1950's; the boom then continued for a few years before dying down. Very recently increases in demand for these and other minerals have again spurred activity in the area. In addition to the mining activities, there are many types of land ownership, both private and public. There is a national forest, the Manti-La Sal, and there are several national parks, monuments, and recreation areas, such as the Canyonlands, Arches

National Monument, the Glen Canyon National Recreation Area in Utah and the Colorado National Monument in Colorado, all in or near the Colorado River. The Navajo Indian Reservation is on the southern border. Elevations vary from about 3,200 to approximately 13,000 feet with, of course, varying weather and rainfall conditions.

The area is bounded on the west by the Colorado and Green Rivers, on the north by Interstate 70 (U.S. 50 and 6) from the town of Green River, Utah, to Grand Junction, Colorado, on the east by a line southerly from Grand Junction to the Utah line near the northern section of the Manti-La Sal National Forest. The boundary generally follows the state line south to the Four Corners and then west on the Utah-Arizona border to the Colorado River. All of San Juan County, Utah, one of the eight counties subjected to a different part of the present forage study, lies within the area described above.

Contacts before and during the visit to the area were made with the state director of the Bureau of Land Management in Salt Lake and with district managers and other personnel in Monticello and Moab, Utah, and in Grand Junction, Colorado. The manager of the Utah Mining Association was most helpful in supplying information.

It appears that in the Utah portion of the area there are about fourteen identifiable mining "districts," mostly associated with uranium. Grazing, either sheep or cattle, is probably involved in all of them to some extent. The range in elevation of these districts may cause the grazing use to be quite variable. Adjacent or within these so-called "districts" considerable oil and gas exploration exists. With it there is some production and considerable pipelining. Before discussing briefly each of ten of the districts within the area boundary, further descriptive comment may be helpful. Much of it comes from Bureau of Land Management literature.

The minerals produced in the area of study include, in addition to petroleum and natural gas, uranium, vanadium, copper, potash, silver, zinc and gem stones. Sand, gravel and some building stone are also mined or quarried. San Juan County is the leading oil producing county in Utah and it ranked second in total mineral production in 1965. Grand County to the north in Utah presents a similar picture as does Mesa County eastward in Colorado. Uranium is probably the chief locatable mineral in the two Utah counties in the area; vanadium, on a value basis, may well be the chief mineral in the Colorado and border section. In 1965, some sixty properties were producing minerals in the Utah counties and presently there are many more.

Yellow Cat District. This district is located near the Colorado line, almost directly east of Green River, Utah. Route U.S. 6-50 passes just north of it and it is therefore readily accessible, in close proximity to the Colorado River. The boundaries arbitrarily selected for it extend for about 40 miles west to the Colorado border and south 15 to 20 miles. The

principal mining activity is concentrated in the Yellow Cat Region of about 15 square miles, located midway between the towns of Cisco and Thompson and south about 8 miles. A surfaced road of this length connects the mining operations with U.S. highways 50 and 6.

Near the towns of Cisco and Crescent Junction there has been considerable oil and gas exploration work. Both test wells and oil and gas producing wells exist. Twenty-five miles of pipeline are in the area in one line running northeast or southwest.

A list of mining facilities for this district is shown in Table VII-28 An estimate of approximate acreages occupied by these facilities and their services is also shown. The total acreage occupied, 463 acres or 0.723 square miles, expressed as a percentage of the total district area of about 720 square miles, is 0.1 percent. (ratio = 0.001) In other words, one acre in every one thousand is used for mining operations. If this acre was compared with lands only, available for grazing, the ratio would be higher but still quite small. If only 10 percent of the total land is available for grazing, 1 percent of it would be occupied.

Perhaps more meaningful is a comparison with the concentrated mining area of 15 square miles. The occupied acreage in this concentrated section is approximately 120 acres or 0.188 square miles. The comparable ratio is 0.0125 or 1.25 percent. This percent would be higher if the comparison was made with grazing lands only. The impact would still be small as the area appears to be mostly desert public land.

In view of the above results, reviews of the remaining areas will be limited as much as possible to concentrated mining operation areas.

Sinarump District. This is a very small area less than 1/2 mile east of U.S. 160 about 20 miles south of Crescent Junction, Utah. Aerial photographs in 1952 showed a mine, several tunnel entrances and a prospect located near the breaks leading to the Courthouse Pasture Mesa. At the time there was less than 3 miles of unpaved service road to these operations.

It has been reported that operations here have recently been renewed. It is not believed that the impact of these operations on grazing is significant.

Polar Mesa District. This is a wide area of about 18 square miles and extends into Colorado on the east. Activity is scattered over the area and has accelerated recently near Polar Mesa. There are several landing fields, at least six mines, two shafts, seven tunnels, twelve prospects and about 40 miles of service road. These installations cover at least 72 acres of land, an insignificant amount. Operations on the Colorado side, near Gateway, are comparable in size and number to those on the Utah

TABLE VII-28

ESTIMATED ACREAGES OCCUPIED BY MINING OPERATIONS, YELLOW CAT DISTRICT

Facility	Approximate Number	Size Length	Estimated Surface Acreage Occupied
Mines	19	Variable	-
Shafts (separate)	7		2
Tunnel entrances	26		6
Prospects	16		2
Test wells	23		6
Oil and gas wells	24		6
Mine buildings	50	Variable	20
Gravel pits	9		20
Service roads	-	75 mi.	181
Jeep trails	-	50 mi.	60
Pipeline	1	25 mi.	60
Mine service areas	-		80
		Total	463 acres or 0.723 sq.mi.

side. They also have accelerated particularly in uranium and vanadium. Unusual activity has taken place in the Calamity Mesa District.

La Sal Mountains District. This district is small with some concentrations of activity, particularly in the vicinity of the Yellow Circle Mines. It has a number of tunnels and prospects and considerable unpaved service roads. Interest in the district has increased recently. Some improved roads, even paved, and evidence of truck hauling were observed. It appears that very little stockpiling is taking place in any of these districts, with the mined ore being transported at once to processing locations.

Big Indian District. A fairly large district, Big Indian's claim to fame lies in the fact that it was here that Charlie Steen discovered uranium in the early 1950's. The entire area, closed down for a decade, is now opening up again. There is considerable activity in uranium, potash, and probably vanadium. The Lisbon Oil operation is located here and apparently operates some of the older uranium holdings.

The district straddles the Utah-Colorado line with most of the activity on the Utah side. In it are more than 20 mines, some quite large with accompanying buildings, at least 30 tunnels, 10 shafts and 20 prospects. Some 90 miles of service road exist; most are dirt roads. In parts of this district considerable grazing appears to be taking place. In the relatively small areas of concentrated mining activity, embracing three or more mines, shafts, tunnels and many service roads, the impact on grazing would undoubtedly be great and sufficient to preclude grazing. It is recognized that this is a higher use of very small acreages.

To the east in Colorado is the Paradox Valley Region. Operations here are very extensive along the Dolores River and its tributaries. Placer mines are generally along the bottoms, whereas tunnels and mines are near or at the top of the cliffs above the bottoms.

Indian Creek District. Activities in this relatively small district, although renewed recently, appear to be somewhat scattered. Indian Creek State Park is located here and there are archeological remains. A reservoir has been constructed to provide water for irrigation. The impact of mining activities, if any, would appear to be greatest in relation to the area's recreational use value.

White Canyon District. While there was some mining activity in this district in the early 1950's, it was minor compared with the activity today, according to reports. The activity is concerned mostly with uranium and both drilling and strip procedures are in existence. It appears that much of the work is concentrated in several places in and near the White Canyon itself. The Happy Jack Mine is reputedly one of the larger

operations. The number of roads in and about the area is very large. It is fairly certain that any grazing on public lands in this district which is used for extensive mining, is affected to the extent that it would disappear fairly soon. In adjacent areas, however, with less concentration, multiple use would be a possibility.

Red Canyon District. Red Canyon is adjacent to White Canyon and the two districts could be considered as one. Mining concentrations in it may be fewer in number, but otherwise the same comments may be made for both districts.

The entire area, including the two canyons, has been a wintering area, particularly for wildlife. Many deer winter here and it is the breeding and lambing ground for desert bighorn sheep. Quite recently it was estimated that in San Juan County about 40,000 deer grazed on public lands. The forage resource for wildlife and livestock may be decreased little by mining operations such as are described for the White and Red Canyon Districts; on the other hand, use of the area by deer and bighorn for wintering and lambing may be very considerably affected simply from opening up the canyons with many roads, airstrips, various operations, etc. It has been estimated that about 200 desert bighorns live on the mesas and crags; how many come greater distances to the breeding areas is not known. Presumably, the use of the area in this respect could be discontinued and a substitute area found.

Blanding District. South and west of Blanding, Utah, is an older mining district. The principal concentrations are in Cottonwood Canyon. There are numerous tunnels and over 10 miles of service roads. There is some oil and gas exploration with gas but little oil. The area has seen renewed activity recently. The impact on grazing does not appear to be substantial. Incidentally, oil in San Juan County was first found just south of here in 1879 in Mexican Hat.

Montezuma District. Directly east of Blanding is another mining district that is also quite old. It has experienced considerable activity lately particularly in exploration for uranium although there has also been some oil exploration. The uranium exploration has consisted of some deep core drilling; several layered structures have been discovered. The most important concentration in the past has been in the vicinity of Dodge Canyon along the canyon sides. Altogether there are at least 15 mines, about 30 tunnels, some prospects, and about 25 miles of service road. Except in the larger mines and concentrations where grazing might be affected some, it is not believed that the total effect is significant.

General Comment

With sufficient funds and time, the Polar Mesa and Big Indian Districts might have been extended to include all of their adjacent counterparts in Colorado, namely, the Coates Creek, Gateway, and Paradox Valley areas. A majority, then, of the uranium and vanadium operations would have been studied. From information available, there are more concentrations of activities in these Colorado areas, there may be more grazing, and consequently the impact on this grazing may be greater than that indicated in the Utah districts. On the other hand, however, averages may be quite similar.

Portions of these areas are in the Manti-La Sal National Forest and it is of interest to note that this forest has prepared multiple-use planning maps to indicate management zones. The Bureau of Land Management, through its Grand Junction District office, has prepared very recently as part of the Piñon Mesa Resource Area a planning map of the Gateway District. These studies, of course, are not the only ones that these federal agencies have made or are making.

An opportunity was provided to travel near part of the area from Durango north to Grand Junction, through the silver, gold, lead, zinc and copper producing region near Silverton. Coal mining operations were noted west of Grand Junction near Cameo and Clifton but little or no grazing exists in the vicinity.

Oil or Gas Exploration and Production Areas

It was decided that the so-called Four-Corners Area, where the states of Utah, Colorado, New Mexico and Arizona meet at a point, would be a satisfactory choice for this phase of the study. The region has long been used for livestock grazing and first oil and then gas were discovered there in considerable quantity almost a century ago.

The area selected is mainly in New Mexico, centered about Farmington, and generally having the boundaries of the San Juan Oil and Gas Basin. The southern boundary is an east-west line parallel to and about 50 miles south of the northern border of New Mexico; the eastern boundary is a north-south line parallel to and about 100 miles east of the western border of New Mexico. The boundary on the west extends as necessary into Arizona and north into Utah to include the Aneth field and east to include, as necessary, extension into Colorado.

Quadrangle maps prepared by the U.S. Geological Survey were obtained for most of the above area. The ones for the Arizona portion were made in 1954 and 1951 and were of limited use. The area in Utah embraced parts of the Aneth Oil Field and the maps were dated 1957, 1962 and 1963. The Colorado maps varied in dates from 1957 to 1964 with two made in 1911 and 1912.

Actually, the large maps of the area, prepared by the Branch of Oil and Gas Operations of the U.S. Geological Survey, are the best source of information available regarding oil and gas operations. The latest maps were made in 1967 and are very current. Copies are available through the Roswell, or the Farmington, New Mexico, offices of the U.S. Geological Survey. Contacts were made with these offices and a brief visit was made to the Farmington offices of both the U.S. Geological Survey and the Bureau of Land Management District. Grazing maps showing forage details have evidently been prepared in rough form. They are located in Albuquerque and are not presently reproducible. The coverage on them may not be complete.

The New Mexico office of the Bureau of Land Management has prepared, for most of the state, excellent color quadrangle maps showing current land status and use. Those available for the study area were obtained; with the exception of one, noting a March, 1968, revision, all have been revised as of July, 1966. The maps are particularly useful in conjunction with the U.S. Geological Survey maps showing oil and gas operations.

It was discovered early that oil and gas operations in the Arizona portion of the district, bordering New Mexico on the east and Utah on the north, were very minor and practically non-existent. Most of this land is on the Navajo Indian Reservation. No operations are recorded as being in Coconino County and in Navajo County; such is also the case in the portion of San Juan County, Utah, directly north. There is minimum activity in Apache County near the Four Corners, however. North in Utah is the Mexican Hat area, whose fields now are largely depleted; east, however, are seven very active fields or units: the Bluff, Gothis-Mesa, Ratherford, McElmo Creek, White Mesa, Ismay Flodive Park, and Aneth Units. There are pumping stations, a gasoline plant, and gas and oil pipelines. Three of the fields are separated and grazing impacts are probably small; the other four are contiguous and the total impact on grazing is somewhat greater. This area was visited and it was difficult to ascertain the impact, particularly in regions of production rather than exploration and drilling. A herd of sheep in one case and some cattle in another were observed in and around wells; it is possible that water was present also in these instances.

The U.S. Geological Survey Branch of Oil and Gas Operations has prepared in 1958 a map showing the central part of Paradox Basin and operations within it. This region, the Big Indian and Lisbon Valley area in Utah, and the Paradox Valley area in Colorado, have already been discussed in the previous section on hard-rock mining. Current and abandoned oil and gas wells together with pipelines are shown. The data, however, may not be up to date.

The magnitude of the oil and gas operations in the New Mexico part of the study area is such that here only general comment can be made. The fields and operations are widely spread but relatively dense compared to such operations viewed in other locations. Of course, the San Juan Basin is well known for the quantity of oil and gas that has been discovered and pumped there over the years. The U.S. Geological Survey Branch of Oil and Gas

Operations has much data and the map showing the basin in detail would be most helpful for detailed studies. The latest map is dated 1967 and the status of wells and their character (abandoned, dry, flowing, drilled, injection, etc.) are quite current. Concentrations seem to be greatest near the San Juan River itself and about Farmington and neighboring communities. Activity decreases rather rapidly to the west and south through the Navajo Indian Reservation; it also decreases, oil first and then gas, to the east and all but disappears in about 60 miles.

The impact of the oil and gas industry in this concentrated area is evidently considerable; certainly much total area is involved with the operations, particularly in concentrations. There is little doubt that everyone recognizes the great wealth and value that lies in these resources. Bureau of Land Management and U.S. Geological Survey personnel state that there is considerable cooperation between all groups. Although exceptions are admitted, the challenge has evidently been met and sensible decisions made.

In order to obtain some measure of the magnitude of operation in a concentrated area, a relatively small but typical field was selected and physical values estimated or tallied. Such a field is the Horseshoe Gallup Unit and the much smaller N.E. Hogback Unit adjacent on the south. The field runs northwest and southeast and is generally north of the San Juan River from 3 to 10 miles. The town of Shiprock is a few miles southwest and Farmington is less than 20 miles southeast. The field is currently producing only oil; the Navajo Indian Reservation eastern boundary bisects it north and south and the Ute Mountain Indian Reservation boundary intersects it near the southern end running east and west. The balance of the field appears to be public domain, perhaps part of the National Land Reserve which fell into disrepute and is not now used. It is not large. The following installations were found to be present in the field in approximately the quantities shown in the table below:

Item	No.
Drilling Wells	0
Producing Oil Wells	184
Producing Gas Wells	0
Gas or Water Injection Wells	131
Abandoned Wells	30
Water Supply Wells	0
Total	345

The area of the field is very close to 36 square miles; the average number of installations per square mile is therefore less than ten. If the abandoned wells are not counted the average is close to nine. Within the field there are 14 square miles without any installations or with only one or two. The average then for the concentrated part is about 14. Assuming that each well occupies 0.5 acres, a total of 7 acres in 640 acres, or about 1 percent, would be occupied. The above assumption would include

piping, pumps, storage tanks and is perhaps large. In the field are several access roads, a pumping station and about 7 miles of the Bureau of Mines 4-inch gas pipeline. As in the Utah example, it is very unlikely that mere occupied area has much impact on the forage resource or on the grazing procedure itself.

As there were no producing gas wells in this particular field -- there were several not far away -- the several gas fields in the Blanco and Bloomfield Region were enumerated. Regardless of the status of the land, public or private, the number of gas wells per square mile appears to be about six; in some places five and six wells per square mile are found with only a few with seven or eight.

Almost due south of the Horseshoe Gallup Unit and less than 10 miles distant is the location of a large thermal electric power plant recently constructed for an Arizona electric power utility. Beside the plant itself is a lake, a dam, and a disposal area. Adjacent also is a sizeable coal source on lease to the Utah Construction Company and extending some 23 miles south with an average width of 1 to 2 miles. The boundaries indicate an area of approximately 40 square miles, entirely within the Navajo Indian Reservation. The area occupied in this instance is considerable and grazing as it may occur would be affected. Perhaps of concern is the problem that arises with certain weather conditions when smoke from the plant spreads across much of the basin. It is doubtful that this type of pollution has much permanent deleterious effect on the forage resource, however.

General Comment

It might be pointed out that in the region just reviewed in regard to oil and gas operations other types of mining exist. There were many evidences of such mining in the southeast portion of Utah and this fact was covered in the previous discussion involving hard-rock mining. The same situation holds for the more northerly (in Colorado) and eastern parts of the region. Of course, the Paradox Valley section further north has considerable operations in all categories. The coal source south of Farmington is an example of still another type of operation.

Mining Claims Area

Selection of an adequate area in which mining claims and prospecting would be predominate was quite difficult. The study regarding hard-rock mining included prospecting operations as they were discovered. One particularly good area would have been in the Calamity Mesa portion of the Gateway Region in Colorado. At any rate, it was determined that considerable mining claim work was taking place in Nevada so an area in north central Nevada was selected and approved. Accordingly, contacts were made

beforehand with Nevada Bureau of Mines personnel, Bureau of Land Management district offices, and a mine operator. A visit was made to the area in October, 1968.

The area selected is bounded on the west by a line near Battle Mountain, Nevada, extending southerly to the Austin area, thence easterly through Eureka and Hamilton to the Ely District, thence northerly to Wells and then westerly back to Battle Mountain. The area involved was rather large, approximately 110 miles east-west and 130 miles north-south, but no attempt was made to investigate all of the claims or operations within it. The objective of the visit and the study was to see the general area and inspect firsthand several sites within and on the perimeter of the area.

The study area at the north is characterized by a checkerboard area about 25 miles wide consisting of alternate sections of patented land and public domain. Small strips of federal agency withdrawal land run north and south through the selected area. The rest of the area to the south is mainly public domain but included are portions of the Toiyabe National Forest and the Humboldt National Forest. Several small lakes and a national wildlife refuge are located in the northeastern portion.

The Nevada Bureau of Mines Map 26, Land Status Map of Nevada, by Roland V. Wilson, prepared by the Mackey School of Mines, University of Nevada, 1964, contains very valuable information. It was prepared in cooperation with the Bureau of Land Management. The Bureau of Land Management districts have similar district maps that are most useful.

A reduction in the conflict between ranchers and miners, and a basic change in the mining laws, resulted from the passage of the Multiple Surface Use Act, Public Law 167, which became effective July 23, 1955. The Act amended the general mining laws by limiting the rights of the holder of an unpatented mining claim in his use of the surface and surface resources. It applies to all unpatented mining claims on public domain of the United States and land in which the United States has reserved minerals.

As to mining claims hereafter located, the law, prior to patent:

1. Bars the use of a mining claim for any purpose other than prospecting, mining, or processing operations and uses reasonably incident thereto.

2. Permits the United States to manage and dispose of the timber and forage, to manage other surface resources -- except mineral deposits subject to location under the mining laws -- and to use so much of the surface of the mining claim as may be necessary for such purposes or for access to adjacent land, so long as these activities do not endanger or materially interfere with mining operations or related activities.

3. Precludes a mining claimant from removing or using the timber or other surface resources, except to the extent required in his mining or processing operations.

None of these limitations apply after patent, and the patentee will acquire the same title to the mining claim as if this law had not been enacted.

It was apparent that there was need for a conservation measure of this type, since each year thousands of mining claims had been or were being filed, not for actual mining purposes but for acquisition of timber, homesites, grazing, water, and control of power sites. The owner's rights to patent his claim are not diminished by the new law; he can patent a valid claim just as before and when he obtains patent he still acquires full ownership of the mineral and surface resources.

Before commencing the area visit, a call was made at the Bureau of Land Management district office in Battle Mountain where the district manager reviewed, in general, mining operations in the area. Incidentally, a mining engineer is located in this office with responsibilities not only for the Battle Mountain District but for the Winnemucca and Elko Districts as well. It was observed that there were relatively few unpatented mining claims in the area. There was no direct indication that mining interests were posing any particular problems in connection with grazing operations.

Previous to the visit it had been learned that the Cortez District, about 30 miles east and about 40 miles south of Battle Mountain, was the site of a new open-pit gold discovery that was announced early in 1968 as a joint venture of American Exploration and Mining Company, Bunker Hill Company and others. It was reported that this operation holds several square miles of unpatented claims. The older operation there and at Buckhorn, about 6 miles distant, have patented claims and 3 or 4 square miles of patented land. Evidently geological work has been going on for some time as has drilling and stripping work. A plant is being constructed and an exploration adit driven. An asphalt, penetration-type pavement has been placed on a rebuilt access road from the site to the paved state secondary Route No. 21 a few miles away in the valley. Considerable grazing was noted all along this valley to its intersection on the north with U.S. 40 at Beowawe. A few miles away, on Route 21, the Gold Acres operation is located. It appeared that some action was taking place although there was no direct report concerning it. Patented land is there and at least five patented mining claims are nearby. About 10 miles to the west are two other districts, Lewis and Hilltop, both with parcels of patented land (perhaps old mines) and at least four patented mining claims.

In Battle Mountain is a small plant devoted to the production of barite or barium. At least five large companies are interested in this region for the purpose of locating plants of this nature.

South of Battle Mountain on State Highway No. 8A about 10 miles and to the west are several copper plants, two of which are operated by the Copper Division of DuVal Company. Maps indicate that the name of the district is Copper Canyon; there are several square miles of patented land here and at least three patented mining claims.

A few miles farther south the Mountain Springs Operation of the Inorganic Chemical Division of the FMC Company was observed; the product could have been phosphate or barium. Even farther south, near the highway also, is Ravenswood with some patented land and a patented mining claim. South about 20 miles is the Austin area.

The Austin area is an old one and it is historically important. As nearly as could be determined, there has been no particular activity, either in mining or exploration, in the older area adjacent to the town recently. On the other hand, it has been reported that much geological work by interested mining companies was taking place in the surrounding area. If so, increased drilling and surface excavating may be expected. Maps show that very near to Austin itself and not far distant the equivalent of about 3 square miles and at least 15 patented mining claims exist. In all probability there are both abandoned and current unpatented mining claims here also.

From the summit just east of Austin and toward Eureka there is little or no evidence of mining but considerable evidence of increased grazing. Cattle were seen along the highway on both sides of Eureka and in fairly large numbers. It was reasoned that at least a part of the public land here was classified as open range.

Eureka is an area very similar to the Austin area. It is old but larger. Near the town and for a small distance south there is patented land in the amount of about 5 square miles. Near this land for the most part but distant several miles are about thirty-five mining claims. There is no report of increased activity in this area.

About halfway between Eureka and Ely and south about 12 miles is the Mt. Hamilton area, wholly within a portion of the Humboldt National Forest. Although there has been some exploration activity recently, it is about to end; there have been no operating mines for some years. Maps show about 4 square miles of patented land and 24 patented mining claims.

Kennecott Copper Corporation's operation near Ely is an extensive one with at least 15 square miles of patented land near Ruth, Kimberly and Ely. Five patented mining claims are shown in and around this operation. Its size is such that grazing probably occurs close by. Incidentally, low grade copper ore is mined here and shipped 22 miles by railroad to the reduction plant at McGill. According to the corporation, the Nevada Mines Division here pays more than $8,000,000 in wages annually and about 60 percent of all taxes in White Pine County.

In Ely, a visit was made to the Bureau of Land Management district office and considerable information was obtained. Personnel there stated that cooperation with mining groups was very good; there is much exploratory work going on in the valley east of Ely. Geophysical surveying teams are very careful about entering fenced areas, requesting permission to enter; the rule is for them to go around rather than over obstructions (fences). They keep Bureau of Land Management officials notified in all respects (progress, problems, etc.). An unsolicited opinion was rendered that some mining laws, at both federal and state levels, need changing. One point of concern seems to be in the element of control with joint use.

The so-called Ward area is about 12 miles south of Ely. While no mining is taking place, there is active exploration on unpatented land, both drilling and underground exploration. Maps show a small amount (1/2 square mile) of patented land and four patented mining claims, probably owned by a previous operator. Two more such claims are located a few miles farther south. Phillips Petroleum is exploring it now for silver, lead and zinc. Sheep are grazed in the area and rumors exist that there is some disagreement between the operators and the sheepmen over water.

North of Ely is the McGill reduction mill and plant; five patented mining claims are close by and ten more are scattered in the valley and at the sides both north and south. Evidences of the exploration work and one survey group were seen during the travel north. Most of this work is for oil and/or gas and is being performed by Shell Oil, Texaco and others.

Some exploration or development work was observed from a distance, principally near Cherry Creek. Maps indicate patented land of about 1 square mile there along with six patented mining claims. In a portion of the Humboldt National Forest a few miles east are two other locations, Aurum and Piermont, with about 1 square mile of patented land and 13 patented mining claims. Farther north is Spruce Mountain with almost 2 square miles of patented land and six patented mining claims. There were no other locations north to Wells.

Using maps, a count was made of the amount of patented land and the number of patented mining claims in the interior of the study area. The amount of land in the first instance approximates about 3 square miles, and the number of patented claims is about twenty-four. The total of all patented land in the area is less than 50 square miles or about 1 square mile in every 1,000 square miles. The total number of patented mining claims is 161; the number of unpatented claims is not known.

General Comment

There is little to add in the way of general comment about this study area. The area is quite different from the others but its selection was a good one. Sources of information were excellent. Incidentally, fairly recent aerial photographic mapping (1965, 1966, 1967) has taken place in the Ely and Elko Districts, jointly sponsored by the Bureau of Land

Management and the U.S. Soil Conservation Service. Again, it appears that the addition of more professionally qualified personnel as time goes on, especially in the Bureau of Land Management, is a policy that is paying off.

Phosphate Mining Area

The Western Phosphate Field consists of an area of over 75 million acres of land. It covers western Wyoming, a corner of Colorado, northern Utah, southeastern Idaho and the southwestern corner of Montana. The largest remaining known phosphate-ore deposits in the field and in the United States are those in southeastern Idaho in the Pocatello, Soda Springs, Fort Hall Region. A number of large mining operations are located here and the region is also a livestock center with considerable grazing. For these reasons the region was selected and approved as the area to be surveyed in this study.

Because of the size of the area it was believed that a visit only to the southeastern Idaho region would be necessary. Accordingly, an inspection was arranged for the fall of 1968, wherein discussions could be held with mining operators in the field and visits could be made to observe firsthand the several surface mining operations.

Attention is called to a report entitled "The Economic Importance of the Western Phosphate Industry" prepared in 1966 by the Phosphate Lands Conference. Members of the Conference are operating companies in the Western Phosphate Field. The holdings of these members total about 80 percent of all of the holdings in it. It appears that the Conference to date has served as a self-evaluating and self-regulating body.

The report, according to its preface, was designed to make available to the Public Land Law Review Commission information requested by its chairman, Representative Aspinall. The Commission was attempting to determine (1) a satisfactory policy for the prevention of unnecessary environmental degradation, (2) the extent mineral exploration and development of public lands conflict with other uses, and (3) methods of weighing the alternatives of competing uses for public lands.

The Phosphate Lands Conference was reportedly organized specifically for the purpose of dealing with the problem of mined-land reclamation. Mention was made in the report to the Commission that there was already in effect a cooperative program with the U.S. Forest Service to gather information relative to revegetation of mined lands. A progress report of this cooperative study to rehabilitate phosphate strip mine sites was prepared by the Caribou National Forest late in 1968. Having reviewed the sites and inspected the project, the report, as furnished to the forage resource study team, is most interesting. Additional comment about it appears later in this discussion.

The Conference has expended effort and funds in developing proposals for regulations for mined land reclamation that it hopes are as satisfactory as possible for all concerned. It has reviewed regulations proposed by the Department of the Interior in the past and has asked that the Public Land Law Review Commission take into consideration the following quoted facts (selected for relationship to forage):

> "Western phosphate lands are, in the main, remote semi-desert lands. The only access to many of the mines are the roads built by industry.
>
> "Very little marketable timber grows on these phosphate lands. Vegetation is principally sagebrush with some grass, scrub brush and lodgepole pine ... vegetation associated with areas of minimal annual rainfall. The average rainfall in the mining areas is 14.1 inches per year as contrasted with 56 inches in Florida and 40.2 inches in West Virginia."

In the Conference report, nine recommendations have been made concerning future legislation bearing on reclamation of western phosphate land. It is stated that the Conference submitted proposed regulations for reclamation to the Department of the Interior in May, 1966.

The phosphate mine operators in southeastern Idaho are proceeding with reclamation. The work is being done at their own expense on public as well as private land.

Of the 75,000,000 acres in the Western Phosphate Field, about 106,000 acres are held by member firms of the Phosphate Lands Conference. This represents 0.14 percent. A little less than 27,000 acres is projected to be disturbed in phosphate mining operations the next 50 years. This represents a lower figure of 0.035 percent. More exact figures (those for today, 3 years later, and adjustments for the fact that the figures represent about 80 percent of the operators) will not increase the percentages significantly. Incidentally, these percentages of area impacts are very nearly the same as those discovered in the other study areas concerned with different kinds of mining operations. The report referred to above contains a statement that the only grazing that will be disturbed is that which is actually disturbed by mining. This is probably true if the areas mined are concentrated and fenced. It is estimated now that this is only about 2 percent of the lands held (the 27,000 acres above). If these areas are largely reclaimed, the effect on grazing is minimized. It should be mentioned that of the 106,000 acres held by the Conference members, about 60 percent or 63,000 acres is public land.

Strip and surface mining, depending on its concentration and the base area of comparison, evidently disturbs, initially at least, more ground area no matter what may be its use than any other type of mining operation. Roads, highways, pipelines, by their very nature, also disturb relatively large areas but the shape of the area is quite different. In one the area

is concentrated in blocks while in the other the area is a few feet wide and miles in length. Area checks on oil, gas, phosphate and coal can be localized to an extent as has been done in this study. It is difficult to compare phosphate mining with coal on any basis although both employ surface mining. The coal mining area near Farmington, New Mexico, and its effect on grazing is difficult to compare with effects in other areas. Perhaps studies industry-wide or by type of mining or both are needed. It has been reported that a federal agency in 1965 made a survey, presumably nationwide, and found that 3.2 million acres of land had been disturbed by surface mining.

In September, 1968, a federal mineral resources official, addressing the National Coal Association, asked the surface mining industry to endorse regulatory legislation rather than to continue to oppose it. He observed that the coal industry continues to receive criticism for strip mining despite its attempt in recent years to demonstrate that it reclaims surface-mined land. He stated further that the time is at hand for federal legislation providing authority for standards of land treatment and rejuvenation following strip mining, as well as for programs to reclaim land that has lain idle and unproductive since being strip-mined in past years. The official, Mr. J. Cordell Moore, Assistant Secretary of the Interior for Mineral Resources, was referring to all strip mining, regardless of the ore mined. It would appear that the phosphate mining industry is a step or so ahead in its thinking and planning. (Two government publications on the subject of strip mining are "Surface Mining and Our Environment," U.S. Department of the Interior, and "Restoring Surface-Mined Land," U.S. Department of Agriculture.)

Officials of the J. R. Simplot Company, Minerals & Chemicals Division, were most cooperative in providing all possible information during the occasion of the visit to the Pocatello area in October, 1968. Especially helpful then and since were the vice presidents of Mining and of Production and the director of Mining Operations. The latter official participated in the visit. It might be expected that the Simplot Company would be interested in the forage study as one of its divisions is involved in the livestock business. Operations consist of highly mechanized, integrated farming and livestock units, spread over 90,000 acres of deeded land in southern Idaho and northern Utah. Thousands of acres of leased grazing lands are also used for the 75,000 cattle and 50,000 sheep that are fed and marketed annually.

The first visit was to the open-pit mine at Gay, some 40 miles north and east of Pocatello. The production from this mine and a similar one at Conda, sites of two major phosphate deposits, is about 3 million tons of ore annually. The ore from Gay mine is loaded directly to the Simplot fertilizer plant at Pocatello and to the electric furnace industry. The entire Gay mine operation was inspected with particular attention being directed to the methods of stripping and stockpiling overburden and to the types and operation of hauling equipment. With the size of the power equipment that is available it is not difficult to understand why surface

mining today, where large quantities are involved, is much more economical than underground mining. The surface mining operation at the Cortez, Nevada, mine involving gold is another good example.

Of particular interest were the various areas where materials over the years had been dumped. Some of the older ones had had little or no reclamation other than shaping and the encouragement of natural seeding and regrowth. These date back some years to 1958 and 1959. There are more recent ones, especially from 1965 to the present; already in 1969 a new panel and dump has been planned and located. Many of the later ones are being reseeded and replanted with the professional advice of personnel from nearby federal agencies. Actually, viewing the areas while in them and from a short distance revealed results that to some persons might be unbelievable. As photography had not been used to any extent in recording results on a time basis, it was suggested that it be used. Some fifteen pictures have been taken since and sent to the forage resource team; several will be made a part of this report if copies can be made available in time.

After the Gay mine visit, the trip was extended to the second one, the Conda mine, about 10 miles north of Soda Springs. This mine and the adjacent Ballard mine, a few miles farther north, are located in draws and mountainous terrain above the flat valley floor. The ore in both cases is hauled to the valley floor and either stockpiled or transported by truck to plant or railroad a short distance away. The Ballard mine is operated by the Monsanto Company and officials provided an opportunity to visit it also. At both mines there was the same magnitude of operation that existed at Gay. Here again and to an even greater extent were evidences of the work of reclaiming mined land through the joint cooperative program. Evidently there are four companies presently involved in the current program; three of them have mines in this area and the study is centered about them. In addition to the Conda mine, operated by the J. R. Simplot Company, and the Ballard mine, operated by the Monsanto Company, there is the Mabie Canyon mine operated by El Paso Products Company. The latter mine was not visited.

A very complete and detailed report of the foregoing report has just been prepared by the Caribou National Forest. 1/ The report outlines objectives, a description of the study plan, study accomplishments in 1966, 1967, and 1968, conclusions to date, and itemized costs. There are location maps, some excellent colored pictures of the work, and appended tables of seed mixtures, plot date, etc.

1/ It is entitled "Progress Report of Cooperative Study to Rehabilitate Phosphate Strip Mine Sites."

General Comment

It might have been mentioned that much of the Gay mine is located on the Fort Hall Indian Reservation. The Simplot Company is planting over 300 acres of dumps and disturbed areas to crested wheat grass, using a seed drill for most of the area but planting by broadcasting when required by some of the steep dump stopes. In this work the company is working with the range supervisor of the Fort Hall Indian Reservation and following his recommendations. The supervisor is establishing some test plots for the application of nitrogen in different concentrations with the company furnishing the cost of fertilizer. Officials of the company report a lot of interest by Fort Hall and that they are pleased with the work and desire to remain involved with it.

Summary of Observations of Grazing in the Four Areas

Hard-Rock Mining - Southeastern Utah

1. From Green River to Crescent Junction, south to Moab, observed practically no animals but there is grazing there.

2. Moab to about 10 miles north of Monticello. Evidences of some grazing. Maps show grazing (ranches, wells, etc.) in the valleys, etc.

3. North of Monticello on south to Blanding. High elevation here - some irrigation and considerable grazing all over.

Oil and Gas - Four-Corners Area

1. South and east to Farmington. Evidence of cattle and sheep throughout. Pretty dry near Four Corners, however.

2. North from Farmington. Quite a bit around Durango, then the mountains. On the downgrade south of Grand Junction to Grand Junction, quite a bit - lots of forage.

3. Grand Junction west to Utah, quite a bit (saw one cow killed on highway).

Mining Claims - Northern Nevada

1. Some grazing around Winnemucca and Battle Mountain, also down Cortez way. Some also from Battle Mountain south to Austin. Could be both cattle and sheep.

2. Austin to Ely. Gain elevation and as noted grazing increases - some timber areas and quite a bit of grass. Near Eureka saw University of Nevada plot, both sides highway, fenced in - was experimental crested wheat grass. Lots of cattle on highway - several had been struck and killed.

3. Ely to Wells and north to Idaho. Out of Ely north is valley with large ranches. Some private land and some fences. North of Wells - much desert, like desert area in southern Idaho.

Phosphate Area - Southeastern Idaho

Lots of grazing around Soda Springs - Montpelier area. Mostly cattle. Feed good.

Fencing

Very little of it in the areas viewed. Saw none in the oil fields except perhaps around pumps in some cases. Large areas, in some cases at least, are fenced, others not. Phosphate areas had some fencing (access roads in draws had fences and one gate across the road).

Sheep

Didn't see many sheep. Mentioned in report seeing one or two of several hundred animals around wells (oil or water injection ones perhaps) in Four-Corner area. Should be some in Nevada but didn't see many.

Site Areas

No real problems with areas themselves although there probably were minor ones. The roads and pipelines (construction of) were mentioned more than anything else. A lot of drilling by a lot of people at the same time in a valley could raise havoc therein. Doing assessment work with bulldozers without regard for the type of excavation made was mentioned as troublesome by some ranchers.

Acreage Occupied

Under the most unfavorable conditions and including all roads, perhaps as much as 2 percent of the public land is occupied by mining facilities in the areas investigated. In most places it was less than 0.1 percent. Considering that these locations were selected for the relatively high intensity of mineral industry activities, their impact on grazing in the whole area of the western states is exceedingly small.

TABLE. VII-18

CHANGES IN PERMITTED NUMBER OF LIVESTOCK ON PUBLIC LANDS BY STATE AND AGENCY BETWEEN 1947 AND 1966.a/

	USFS			NPS			BLM			BSFW			BR			BIA			DOD			All Agencies		
	Number of Permittee Animals 1947	Increase or Decrease, 1966 No.	Increase or Decrease, 1966 %	Number of Permittee Animals 1947	Increase or Decrease, 1966 No.	Increase or Decrease, 1966 %	Number of Permittee Animals 1947	Increase or Decrease, 1966 No.	Increase or Decrease, 1966 %	Number of Permittee Animals 1947	Increase or Decrease, 1966 No.	Increase or Decrease, 1966 %	Number of Permittee Animals 1947	Increase or Decrease, 1966 No.	Increase or Decrease, 1966 %	Number of Permittee Animals 1947	Increase or Decrease, 1966 No.	Increase or Decrease, 1966 %	Number of Permittee Animals 1947	Increase or Decrease, 1966 No.	Increase or Decrease, 1966 %	Number of Permittee Animals 1947	Increase or Decrease, 1966 No.	Increase or Decrease, 1966 %
	(1,000 Animals)																							
Montana	459	-199	-43				853	- 11	- 1	36	- 4	-11	12	0	0	2	3	150	1	2	200	1,313	-209	-16
Idaho	943	-319	-34				1,461	- 126	- 8	b/	5		39	-2	-5				8	-2	-25	2,451	-444	-18
Wyoming	650	-151	-23	4	-1	-25	2,782	- 254	- 9				171	30	17				10	0	0	3,617	-366	-10
Colorado	925	-280	-30	10	4	40	b/	1,013		2	2	100	b/	11					10	-1	-10	946	756	79
New Mexico	244	- 89	-36	3	-3	-100	899	- 259	-29	2	0	0	4	0	0	1	11	1,100	1	3	300	1,154	-337	-29
Arizona	303	- 76	-25	16	-5	-31	168	117	70	4	0	0	15	-11	-73							506	25	5
Utah	540	-119	-18	22	-2	- 9	1,920	- 558	-29				50	-13	-26				11	-3	-27	2,643	-725	-27
Nevada	277	-108	-39				1,153	- 161	-14	4	8	200	12	-5	-42				1	2	200	1,447	-264	-18
Washington	74	- 19	-26				b/	15		b/	10		20	-3	-15				b/	4		84	7	7
Oregon	263	- 79	-30				1	492	492	4	32	800	b/	2					b/	1		288	448	167
California	600	-386	-64	2	2	100	546	35	6	1	14	1,400	9	-2	-22				5	4	80	1,163	-332	-28
11 Western States	5,379	-1,824	-34	57	-5	-9	9,733	273	3	53	67	126	332	17	5	3	14	467	47	11	23	15,604	-1,447	- 9
United States	5,491	-1,705	-31	57	-3	-5	9,741	275	3	76	89	117	333	19	6	11	22	200	49	137	280	15,758	-1,167	- 7

a/ Sources: Compiled from tables supplied to the Public Land Law Review Commission by the various agencies. Includes use and non-use permits. Data supplied appear to be incorrect for the Bureau of Land Management in the states of Arizona and Oregon. Other sources (U. S. Dept. Interior, Bureau of Land Management, 1947. Report of the Director of the Bureau of Land Management, Statistical Appendix, Washington, D. C., page 82; and U. S. Dept. Interior, Bureau of Land Management, 1967. Public Land Statistics. Superintendent of Documents, Washington D. C., page 151) show a 24 percent increase in the number of animals permitted on Grazing Districts in Arizona and a 31 percent decrease in Oregon between 1947 and 1966.

b/ None reported in 1947

TABLE- VII-17

CHANGES IN PERMITTED NUMBER OF ANIMAL UNIT MONTHS (AUMs) ON PUBLIC LANDS BY STATE AND AGENCY BETWEEN 1947 AND 1966.[a/]

	USFS			NPS			BLM			BSFW			BR			BIA			DOD			All Agencies		
	Number of Permitted AUMs	Increase or Decrease, 1966		Number of Permitted AUMs	Increase or Decrease, 1966		Number of Permitted AUMs	Increase or Decrease, 1966		Number of Permitted AUMs	Increase or Decrease, 1966		Number of Permitted AUMs	Increase or Decrease, 1966		Number of Permitted AUMs	Increase or Decrease, 1966		Number of Permitted AUMs	Increase or Decrease, 1966		Number of Permitted AUMs	Increase or Decrease, 1966	
	1947	No.	%	1947	No.	%	1947	No.	%	1947	No.	%	1947	No.	%	1947	No.	%	1947	No.	%	1947	No.	%
	(1,000 AUMs)																							
Montana	671	-131	-20				1,237	214	17	95	0	0	37	8	22	22	1	4	b/	10		2,062	103	5
Idaho	1,064	-319	-30				1,571	-126	- 8	b/	8		42	-1	-2	2	1	50	21	-10	-48	2,700	-445	-16
Wyoming	881	0	0	7	3	43	2,570	-647	-25	1	-1	-100	204	-3	-2				6	- 1	-17	3,470	-648	-18
Colorado	1,210	- 67	- 6	6	-2	-33	b/	732		6	10	167	2	7	350				14	- 4	-29	1,238	466	38
New Mexico	1,057	-210	-20	4	-4	-100	2,355	-769	-33	3	3	100	7	2	29	b/	38		b/	3		3,426	-937	-27
Arizona	1,734	-277	-16	45	6	13	670	481	69	9	15	167	77	-71	-92							2,535	134	5
Utah	917	-288	-31	13	-1	- 8	2,635	-1049	-40	b/	1		54	6	11				11	-2	-18	3,635	-1,321	-38
Nevada	443	-142	-33				2,404	99	4	27	22	82	37	-4	-11				2	3	150	2,913	-22	- 1
Washington	134	- 35	-28				b/	31		b/	23		28	-4	-14				b/	41		162	58	36
Oregon	448	78	17				3	1166	38867	13	136	1046	2	2	100				b/	6		508	1,388	274
California	1,227	-781	-64	5	4	80	923	-180	-20	4	17	425	32	-10	-31				8	9	112	2,201	-941	-40
11 Western States	9,622	-2,378	-25	80	6	8	14,368	- 67	-0[c/]	158	234	148	522	-69	-13	24	40	167	62	55	89	24,836	-2156	- 9
United States	10,384	-1,903	-18	80	18	22	14,420	- 35	-0[c/]	327	262	80	526	-66	-12	103	113	110	68	980	1,441	25,909	- 632	- 2

a/ Sources: Compiled from tables supplied to the Public Land Law Review Commission by the various agencies. Includes use and non-use. Data supplied appear to be incorrect for the Bureau of Land Management in the states of Arizona and Oregon. Other sources (U. S. Dept. Interior, Bureau of Land Management, 1947. Report of the Director of the Bureau of Land Management, Statistical Appendix, Washington, D. C., page 82; and U. S. Dept. Interior, Bureau of Land Management, 1967. Public Land Statistics. Superintendent of Documents, Washington, D. C., page 151) show a 20 percent increase of permitted AUMs in Grazing Districts in Arizona and a 2 percent increase in Oregon.

b/ None reported in 1947.

c/ Less than one-half of one percent.

TABLE VII-18

NUMBER OF ANIMALS PERMITTED ON THE PUBLIC LANDS IN 1947, THE CHANGE IN NUMBER PERMITTED IN 1966 AND THE PERCENT OF CHANGE BY AGENCY AND KIND OF ANIMAL [a/]

Agency	No. Animals, 1947			Net Change in Number of Animals as of 1966			Percent Change is of 1947 Animals		
	C&H	S&G	Total	C&H	S&G	Total	C&H	S&G	Total
	(1,000 Animals)			(1,000 Animals)			(Percent)		
USFS	1,427	4,063	5,491	46	-1,751	-1,705	3	-43	-31
NPS	22	35	57	-2	-1	-3	-9	-3	-5
BLM	2,215	7,526	9,741	1,236	-961	275	56	-13	3
BSFW	60	16	76	81	8	89	135	50	117
BR	80	253	333	19	0	19	24	0	6
BIA	8	2	11	12	10	22	150	500	200
DOD	12	36	49	136	1	137	1,133	3	280
Total U.S.	3,824	11,931	15,758	1,528	-2,695	-1,167	40	-23	-7
11 Western States	3,687	11,918	15,605	1,265	-2,712	-1,447	34	-23	-9

a/ Source: Compiled from information supplied to the Public Land Law Review Commission by the various agencies. Numbers include use and non-use.

TABLE VII-19

NUMBER OF AUM'S OF PERMITTED LIVESTOCK USE ON THE PUBLIC LANDS IN 1947, THE CHANGE IN PERMITTED NUMBER OF AUM'S IN 1966 AND THE PERCENT OF CHANGE BY AGENCY AND KIND OF ANIMAL a/

Agency	Number of Permitted AUM's in 1947			Net Change in Number of Permitted AUM's as of 1966			Percent Change is of 1947 AUM's		
	C&H	S&G	Total	C&H	S&G	Total	C&H	S&G	Total
	(1,000 AUM's)			(1,000 AUM's)			(Percent)		
USFS	7,917	2,467	10,384	-714	-1,189	-1,903	-9	-48	-18
NPS	63	17	80	19	-1	18	30	-6	22
BLM	8,620	5,800	14,420	2,416	-2,451	-35	28	-42	b/
BSFW	311	15	326	265	-2	263	85	-13	81
BR	321	205	526	-37	-29	-66	-12	-14	-12
BIA	101	2	103	87	26	113	86	1,300	110
DOD	40	28	68	960	20	980	2,400	71	1,441
Total U.S.	17,375	8,534	25,909	2,996	-3,626	-630	17	-42	-2
11 Western States	16,342	8,494	24,836	1,481	-3,637	-2,156	9	-43	-9

a/ Source: Compiled from information supplied to the Public Land Law Review Commission by the various agencies. Numbers include use and non-use.

b/ A decrease of 0.2 percent.

TABLE VII-20 CATTLE AND SHEEP NUMBERS AS A PERCENT OF THE TOTAL NUMBERS PERMITTED TO GRAZE ON PUBLIC LANDS BY THE VARIOUS AGENCIES IN 1947 AND 1966 a/

		USFS		NPS		BLM		BSFW		BR		BIA		DOD		TOTAL	
		1947	1966	1947	1966	1947	1966	1947	1966	1947	1966	1947	1966	1947	1966	1947	1966
Montana	C&H	26	50			46	58	67	72	75	67	50	80	--	67	39	57
	S&G	74	50			54	42	33	28	25	33	50	20	--	33	61	43
Idaho	C&H	14	22			22	28	--	100	26	43	20	57	38	33	19	27
	S&G	86	78			78	72	--	0	74	57	80	43	62	67	81	73
Wyoming	C&H	18	27	100	100	15	28	--	--	12	17			10	--	15	27
	S&G	82	73	0	0	85	72	--	--	88	83			90	--	85	73
Colorado	C&H	22	28	10	14	--	25	100	100	100	36			30	22	22	27
	S&G	78	72	90	86	--	75	0	0	0	64			70	78	78	73
New Mexico	C&H	33	64	75	100	31	42	100	100	50	75	0	6	--	100	34	46
	S&G	67	36	25	0	69	58	0	0	50	25	100	92	--	0	66	54
Arizona	C&H	57	70	62	82	61	81	25	75	53	75					58	76
	S&G	43	30	38	18	39	19	75	25	47	25					42	24
Utah	C&H	18	21	14	15	11	14	--	--	18	19			9	36	13	16
	S&G	82	79	86	85	89	86	--	--	82	81			91	62	87	84
Nevada	C&H	24	36	--	--	30	39	100	100	42	71			--	67	29	40
	S&G	76	64			70	61	0	0	58	29			--	33	71	60
Washington	C&H	28	64			--	60	100	50	45	47			--	75	32	59
	S&G	72	36			--	40	0	50	55	53			--	25	64	41
Oregon	C&H	27	54			100	74	75	100	87	95			--	77	28	70
	S&G	73	46			0	26	25	0	33	5			--	23	72	30
California	C&H	35	56	50	50	32	35	100	40	78	86	100	100	60	33	34	41
	S&G	65	44	50	50	68	65	0	60	22	14	0	0	40	67	66	59
11 Western States	C&H	25	36	38	38	23	34	70	80	24	28	33	29	23	38	24	35
	S&G	75	64	62	62	77	66	30	20	76	72	67	71	77	62	76	65
Other States	C&H	92	89			25	60	100	100	100	100	100	100	50	99	89	93
	S&G	8	11			75	40	0	0	0	0	0	0	50	1	11	7
United States	C&H	26	39	38	38	23	34	79	85	24	28	73	62	24	80	24	37
	S&G	74	61	62	62	77	66	21	15	76	72	27	38	76	20	76	63

a/ Source: Compiled from tables supplied to the Public Land Law Review Commission by the various agencies. Includes use and non-use permits.

NOT REPRODUCIBLE

TABLE XII-21. ANIMAL UNIT MONTHS (AUMs) OF USE BY CATTLE AND SHEEP AS A PERCENT OF TOTAL AUMs PERMITTED ON PUBLIC LANDS BY THE VARIOUS AGENCIES IN 1947 AND 1966 a/

		USFS		NPS		BLM		BSFW		BR		BIA		DOD		TOTAL	
		1947	1966	1947	1966	1947	1966	1947	1966	1947	1966	1947	1966	1947	1966	1947	1966
Montana	CAM	79	91			81	86	93	96	86	87	96	96		90	81	88
	SAG	21	9			19	14	7	4	14	13	4	4		10	19	12
Idaho	CAM	54	64			58	70	—	100	64	78	50	67	67	82	55	68
	SAG	46	36			44	30	—	0	36	22	50	33	33	18	45	32
Wyoming	CAM	85	73	100	100	41	58	100	—	34	45			33	40	45	60
	SAG	15	27	0	0	59	42	0	—	66	55			67	60	55	40
Colorado	CAM	88	77	50	75	—	62	100	94	100	56			71	70	88	70
	SAG	12	23	50	25	—	38	0	6	0	44			29	30	12	30
New Mexico	CAM	87	94	100	—	88	91	100	100	100	78	32	68	—	100	74	81
	SAG	13	6	0	—	12	9	0	0	0	22	68	32	—	0	26	9
Arizona	CAM	94	96	93	88	91	94	44	96	96	83					83	95
	SAG	6	4	7	12	9	6	56	4	4	17					7	5
Utah	CAM	61	64	46	42	41	50	—	100	46	53			9	33	46	54
	SAG	39	36	54	58	59	50	—	0	54	47			91	67	54	46
Nevada	CAM	68	77			68	83	100	100	65	70			50	100	68	82
	SAG	32	23			32	17	0	0	35	30			50	0	32	18
Washington	CAM	72	89			—	100		87	82	79			—	83	74	87
	SAG	28	11			—	0		13	28	21			—	17	26	13
Oregon	CAM	72	88			100	86	92	100	100	100			—	67	72	84
	SAG	28	12			0	4	8	0	0	0			—	33	28	6
California	CAM	77	87	40	78	78	83	75	81	100	100			75	82	78	85
	SAG	23	13	60	22	22	27	25	19	0	0			25	18	22	15
11 Western States	CAM	74	83	79	80	80	77	91	9	61	61	92	56	55	77	86	79
	SAG	26	17	21	20	40	23	9	91	39	39	8	44	45	23	34	21
Other States	CAM	98	98	0	100	50	65	99	100	75	86	100	100	100	100	98	98
	SAG	2	2	100	0	50	35	1	0	25	14	0	0	0	0	2	2
United States	CAM	75	85	79	84	80	77	95	98	81	62	98	87	59	85	87	80
	SAG	24	15	21	16	40	23	5	3	39	38	2	13	41	5	33	20

a/ Source: Compiled from tables supplied to the Public Lands Law Review Commission by the various agencies. Includes use and non-use permits.

TABLE XII-22

PERCENTAGE OF PERMITS ISSUED IN THE ELEVEN WESTERN STATES BY SIZE, CLASS OF PERMIT, BY STATE AND AGENCY 1966

U.S. FOREST SERVICE

Permit Size (AUM's)	Ariz.	Calif.	Colo.	Ida.	Mont.	Nev.	N.M.	Ore.	Utah	Wash.	Wyo.	Total
0- 50	4.6	36.5	12.1	21.3	28.0	10.6	41.4	24.9	24.3	25.1	13.1	22.9
51- 100	4.0	9.7	9.9	14.2	16.7	5.1	13.1	11.3	13.8	17.0	8.8	12.2
101- 200	8.7	14.3	13.0	16.2	19.0	9.9	14.3	15.8	22.4	18.9	14.6	17.1
201- 500	19.0	22.8	37.4	27.4	27.1	25.1	14.5	25.5	23.4	27.9	33.0	26.3
501-1000	17.8	12.2	13.9	14.1	11.2	32.6	7.4	14.8	9.2	9.6	18.3	13.0
1001-2000	16.4	3.6	5.4	5.4	3.2	10.6	5.0	5.7	1.5	1.3	8.0	5.1
2001-3000	12.8	0.7	1.9	0.8	0.6	4.0	2.1	1.2	0.2	0.2	2.6	1.8
3001-4000	4.7	0.2	0.3	0.1	0.2	1.3	1.0	0.7	T *	0.0	0.8	0.6
4001-5000	5.3	0.1	0.1	0.1	0.0	0.0	0.3	0.1	T *	0.0	0.1	0.3
Over 5000	7.8	0.0	T	0.1	0.0	0.8	0.8	0.0	0.0	0.0	0.1	0.5
Total **	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

BUREAU OF LAND MANAGEMENT

Permit Size (AUM's)	Ariz.	Calif.	Colol	Ida.	Mont.	Nev.	N.M.	Ore.	Utah	Wash.	Wyo.	Total
0- 50	10.6	12.7	22.9	16.5	21.1	2.9	13.9	16.2	13.2	0.0	8.1	15.4
51- 100	6.5	9.5	15.6	13.8	14.3	3.4	10.2	8.7	13.3	0.0	6.7	11.6
101- 200	11.2	10.0	14.9	15.0	16.9	7.3	12.6	12.4	18.2	0.0	13.6	14.7
201- 500	19.2	20.8	20.2	25.4	23.3	17.2	21.8	27.4	22.1	0.0	21.5	21.8
501-1000	17.1	14.4	12.4	12.7	12.8	14.9	14.8	18.0	12.3	0.0	15.6	14.0
1001-2000	14.0	15.6	7.5	8.2	2.4	18.2	14.5	14.3	10.8	0.0	12.2	11.8
2001-3000	7.2	5.1	3.1	3.3	7.7	8.3	4.9	8.8	4.7	0.0	6.6	4.5
3001-4000	4.7	3.4	1.4	1.5	0.7	4.8	2.6	2.8	2.0	0.0	3.5	2.2
4001-5000	2.1	2.9	1.0	0.9	0.3	5.0	1.6	1.6	1.0	0.0	2.3	1.4
Over 5000	7.3	5.4	1.0	2.5	0.4	18.0	3.0	2.9	2.2	0.0	6.8	3.3
Total **	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

U.S. FOREST SERVICE AND BUREAU OF LAND MANAGEMENT TOTALS

0- 50	19.5	1001-2000	7.8
51- 100	12.0	2001-3000	3.0
101- 200	16.0	3001-4000	1.3
201- 500	24.2	4001-5000	0.8
501-1000	13.5	Over 5000	1.6
		Total	100.0

* Less than 0.005
** Total percentage may show rounding errors.

TABLE VII-23

PERCENT LIVESTOCK GRAZING PERMITS TRANSFERRED WITH LAND, LIVESTOCK, LAND AND LIVESTOCK, AND NEITHER LAND OR LIVESTOCK, U.S. FOREST SERVICE AND BUREAU OF LAND MANAGEMENT a/

State	Ranches with Transfers	Percent of Transfers with:			
		Land	Livestock	Land and Livestock	Neither
	(Percent)				
U.S. Forest Service					
Montana	17	40	12	43	5
Idaho	20	16	34	44	7
Wyoming	18	22	27	41	10
Colorado	25	20	43	32	4
New Mexico	20	10	57	25	8
Arizona	28	10	18	43	29
Utah	21	6	54	30	10
Nevada	24	30	3	51	16
Washington	20	24	30	45	1
Oregon	20	21	29	44	5
California	13	22	23	44	11
Eleven Western States	20	17	37	37	9
Bureau of Land Management					
Montana	11	3	9	87	2
Idaho	24	1	47	50	2
Wyoming	20	b/	36	62	2
Colorado	27	1	34	63	2
New Mexico	14	2	2	95	b/
Arizona	22	1	51	46	1
Utah	23	1	64	32	3
Nevada	25	2	36	62	b/
Washington	50	100	0	0	0
Oregon	20	4	18	77	1
California	27	2	23	76	0
Eleven Western States	20	2	38	59	2

a/ Source: Data supplied by the Public Land Law Review Commission from Interagency Fee Study of 1966.
b/ Less than one-half of one percent.

TABLE VII-24

BASE FEE RATES FOR CATTLE AND HORSES, AND SHEEP AND GOATS ON NATIONAL FORESTS BY FOREST SERVICE REGION a/

Forest Service Region	Cattle and Horses b/			Sheep and Goats		
	Number of Different Base Rates	Average Base Rate	Range of Base Rates	Number of Different Base Rates	Average Base Rate	Range of Base Rates
		(cents)	(cents)		(cents)	(cents)
1	13	17.3	10-24	12	4.4	2-6
2	10	19.0	13-26	4	5.7	3.25-6
3	10	11.5	10-13	7	3.1	2.50-4
4	13	15.5	6-20	11	4.2	1.50-6
5	5	19.5	c/ 15-56.4	4	5.5	4.50-6
6	11	16.7	10-22	9	4.2	2.50-5
Sub-total	24	16.7	6-56.4	17	4.47	1.50-6
8	1	15.0	15	1	4.50	4.50
9	5	21.2	11-30	1	4.50	4.50
Sub-total	5	20.0	11-30	1	4.50	4.50
Total	25	16.9	6-56.4	17	4.47	1.50-6

a/ Information adapted from mimeographed sheets supplied by the PLLRC. These data show grazing fee base rates by regions and forests for the years 1956, 1957, 1958, 1959, and 1960. National Grasslands are excluded.
b/ Fees for horses are 1.5 times the fee for cattle.
c/ The 56.4 cent base fee in Region 5 is on land that was acquired by a land exchange with the U.S. Army. The Forest Service acquired approximately 25,000 acres that was under grazing lease to three lessees. The Army was charging $2.00 per animal month and the Forest Service prorated this value back to the 1931 base fee period. Without this value the range in Forest Service base fee rates would be 6 to 30 cents for cattle.

TABLE VII-25

FEE RATES OF THE BUREAU OF LAND MANAGEMENT PER ANIMAL UNIT MONTH WITHIN GRAZING DISTRICTS (1935-1968) a/

Year	Charge per AUM of Grazing b/
1935-1946	5
1946-1950	8
1950-1954	12
1954-1957	15
1958	19
1959-1960	22
1961-1962	19
1963-1965	30
1966-1968	33

a/ Source: Clawson, Marion. 1967. The federal lands since 1956; recent trends in use and management. Resources for the Future, Inc. Baltimore: John Hopkins Press. Appendix Table 12, p. 67.

b/ Sheep are charged at one-fifth the rate for cattle. Beginning in 1956, horses are charged at double the rate for cattle.

TABLE VII-26

EXAMPLES OF CHARGES FOR THE USE OF INDIAN LANDS FOR GRAZING BY NON-INDIANS AND INDIAN OPERATORS WITH MORE THAN 250 ANIMAL UNITS IN 1966 a/

Location	Charge per AUM	
	Tribal Land b/	Allotted
Cheyenne River, South Dakota	$1.46	$1.32
Pierre (Lower Brule and Crow Creek), South Dakota	1.33	1.33
Fort Berthold, North Dakota	1.38	1.41
Pine Ridge, South Dakota	1.83	1.90
Rosebud, South Dakota	1.46	1.77
Standing Rock, South Dakota and North Dakota	1.38	1.40
Colville, Washington	--	1.26
Spokane, Washington	--	1.00
Yakima, Washington	--	1.70
Umatilla, Oregon	--	1.73
Fort Hall, Idaho	--	1.50

a/ Information obtained by correspondence with the Bureau of Indian Affairs at Aberdeen, South Dakota, and Portland, Oregon.

b/ Values listed are minimum bids received and may or may not be the bid accepted.

TABLE VII-27

EXAMPLES OF CHARGES MADE FOR USE OF DEPARTMENT OF DEFENSE LANDS FOR GRAZING a/

	Rental Per AUM
Department of the Army	
Camp San Luis Obispo, San Luis Obispo County, Calif.	$3.00
Hunter Liggett Military Reservation, Monterey County, Calif.	2.66
Navajo Army Depot, Coconino County, Arizona	3.50
Tooele Army Depot, Tooele County, Utah	1.46
Department of the Navy	
Camp Pendleton, California (Sheep)	1.00
Department of the Air Force	
Vandenberg AFB, Santa Barbara County, California	3.50
Davis Communications Annex, Yalo County, California	3.26
Beale AFB, Yuba and Nevada Counties, California	3.83

a/ Information supplied by the Office of the Assistant Secretary of Defense.

Land Utilization Projects

The acquisition of 11.3 million acres by the Federal Government to establish 250 Land Utilization projects took place between 1933 and 1946. (26) This acquisition program was developed to correct some of the land use problems arising from previous land disposal policies and settlement patterns. The projects are located in 45 states and are designed to serve as demonstration areas of good land use practices. Projects in the western states are now managed for their multiple use values including livestock grazing, forest production, wildlife, watershed and recreation.

As part of this forage resource study, five Land Utilization project areas were selected for examination. (Figure VII-2) Four of these projects are administered by the U.S. Forest Service and one is administered by the Bureau of Land Management. Three of the projects have National Grassland status.

The National Grassland areas examined were the Curlew in southeastern Idaho, the Thunder Basin in northeastern Wyoming, and the Little Missouri in western North Dakota. The Taos County Land Utilization project was given National Forest status in 1962 and became part of the Carson National Forest in northern New Mexico. The Bureau of Land Management administers many of the Land Utilization projects in Montana, including the Milk River project in the northern part of the state. Data were gathered on that portion of the Milk River project that is located in Blaine County.

The Southeastern Idaho Land Utilization project was established in 1934. Approximately 139 thousand acres were acquired between 1936 and 1943. (29) Prior to 1938, the administration of approximately 8 thousand acres had been assumed by the Fort Hall Indian Agency. Between 1940 and 1942, approximately 46 hundred acres of the purchased land were transferred to the U.S. Forest Service to be administered as part of the Minidoka National Forest. 1/ In 1951, 78.6 thousand acres were transferred to the Department of the Interior for administration by the Bureau of Land Management and the remaining 47.6 thousand acres were transferred from the Soil Conservation Service to the U.S. Forest Service in 1954. In 1960, the area administered by the U.S. Forest Service was designated the Curlew National Grassland.

The Land Utilization program for northeastern Wyoming was initiated in 1935. The first purchases were made in 1936 and 423,898 acres had been

1/ Presently Sawtooth National Forests.

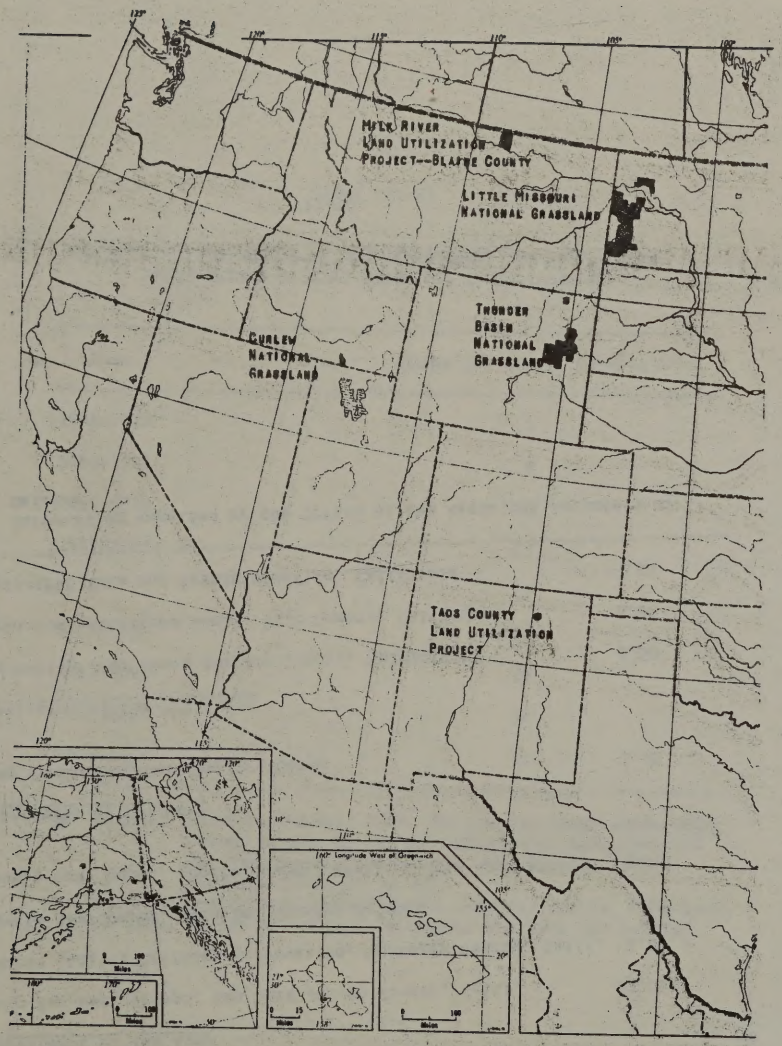

Figure VII-2 Location of Land Utilization Project Areas Investigated.

purchased at the end of 1943. (22) The acreage acquired is located in Weston, Campbell, Converse, Crook and Niobrara Counties and was purchased under two project programs, LA-WY-1 and LU-WY-38-21. The area was designated a National Grassland in 1960 and the U.S. Forest Service presently administers 572,310 acres (20) of land acquired by the purchase program, transfers from other agencies and land exchange.

The Little Missouri National Grassland is composed of land acquired under several Land Adjustment and Land Utilization programs (LA-ND-1, LA-ND-2, LU-ND-38-1, LU-ND-38-2, LU-ND-38-21 and LU-ND-23). Proposals for purchase were first developed in 1934 and land was acquired through 1943. (23) The U.S. Forest Service presently administers 1,026,612 acres (21) under two Ranger Districts. The Medora District with 523,791 acres and the McKenzie District with 502,821 acres are administered by the Custer National Forest.

The Milk River Land Adjustment project (LA-MT-2) covers parts of three counties in northern Montana. (28) Under this project, 953,000 acres were acquired in Blaine, Phillips and Valley Counties after initiation of purchases in 1934. The administration of the Milk River project passed from the Soil Conservation Service to the U.S. Forest Service in 1954 and then to the Malta District of the Bureau of Land Management in 1958.

The Taos County Submarginal Land project (LA-NM-2) was proposed in 1934 and the purchase of land began in 1935. The project area is located in Taos and Rio Arriba Counties in northcentral New Mexico. The land area purchased or proposed for purchase, as of January 1, 1938, was 75,752.67 acres. 2/ Since the project area was within and adjacent to the boundaries of the Carson National Forest, administration of the lands after 1938 was delegated to the U.S. Forest Service. Between 1938 and 1962 the administration followed the specifications of Title III of the Bankhead-Jones Farm Tenant Act. In 1962 these lands were given National Forest status by an Act of Congress (17) and incorporated within the boundaries of the Carson National Forest.

Physical Features

Three of the Land Utilization project areas selected for examination, i.e., the Thunder Basin and Little Missouri National Grasslands, and the Milk River project, are located in the western portion of the Great Plains. Physiographically, this area is part of the Missouri Plateau. (3) The Milk River area and parts of the Little Missouri were glaciated. The Thunder Basin National Grassland is outside the area of glaciation. The short-grass vegetation type is characteristic of this part of the Great Plains.

2/ Data obtained from a list of land acquired or to be acquired under the Taos County Project, LA-NM-2 in the files of the Supervisor's Office, Carson National Forest, Taos, New Mexico.

The Southeastern Idaho Land Utilization project is located in the northern part of the Basin and Range physiographic province. (6) Block fault mountains separated by intermountain basins are physiographic features of the area. The project area is located in two valleys, Black Pine and Curlew. Lake Bonneville extended into these two valleys and formed lake terraces that truncated the lower portions of the alluvial fans. Wind-blown materials were deposited on the levels above the lake terraces. The original vegetation was a sagebrush-grass type with varying amounts of sagebrush.

The Taos County Land Utilization project is at the southern end of the Southern Rocky Mountains physiographic province. (4) Between the Sangre de Cristo Mountains on the east and the San Juan, Nacimiento and Jemez Mountains on the west, is an intervening lava-covered highland. The mountains bordering the highland are similar to those found in the Basin and Range physiographic province. (5)

The topography of the purchase area consists of rolling mesas and a few prominent hills. The area slopes generally to the south. The piñon-juniper type is dominant in the southern portion of the area and an open sagebrush-grass type dominates in the northern part.

Climate

The average annual precipitation in the five Land Utilization areas investigated is estimated from stations in or near the project areas. Average annual precipitation varies from 12.3 inches at Turner, Montana, to 16.0 inches at Watford City, North Dakota. (Table VII-29) The least representative station is Malad, Idaho. This station is located east of the purchase area and appears to have more precipitation than the general project area. The average annual precipitation at Strevell, Idaho, west of the project area, is approximately 10 inches.

Yearly fluctuations in precipitation are features of the semi-arid regions. Yearly precipitation values show strong deviations from the average at the weather stations shown in Figures VII-3 - 7. Years in which the climate is sub-humid are followed by years in which desert conditions prevail. A series of years in the mid-1930's had less than average precipitation at all stations but there have been other periods with low precipitation values.

The average number of days between freezing temperatures (32° F) ranges from 102 at Tres Piedros to 127 at Chinook, Montana. The frost-free period may be as short as 16 days, as at Tres Piedros, or as long as 182 days, as at Malad.

TABLE VII-29

ELEVATION, ANNUAL PRECIPITATION, AVERAGE ANNUAL TEMPERATURE AND NUMBER OF DAYS BETWEEN FREEZING TEMPERATURES

Land Utilization Project Areas and Weather Stations	Elevation (Feet)	Years of Record Reported	Average Annual Precipitation (Inches)	Average Annual Temperature (Degree F.)	Length of Frost-Free Period (Avg.)	(Range) (Days)
Little Missouri National Grassland						
Dickinson, North Dakota	2,714	76	15.6	40.6	112	49-138
Beach, North Dakota	2,824	43	14.1	41.3		
Watford City, North Dakota	2,100	31	16.0	41.8		
Thunder Basin National Grassland						
Douglas, Wyoming	4,853	57	13.4	45.8	120	89-146
Lusk, Wyoming	5,006	68	14.5	44.8		
Gillette, Wyoming	4,556	42	14.0	45.0		
Milk River Land Utilization Project (Blaine County, Montana)						
Chinook, Montana	2,502	52	12.5	42.7	127	85-176
Turner, Montana	2,800	31	12.3	40.5		
Curlew National Grassland						
Malad, Idaho	4,420	45	14.2	46.5	124	94-182
Taos County Land Utilization Project						
Taos, New Mexico	6,965	63	12.5	47.5	134	92-185
Tres Piedras, New Mexico	8,110	35	13.6	42.3	102	16-138

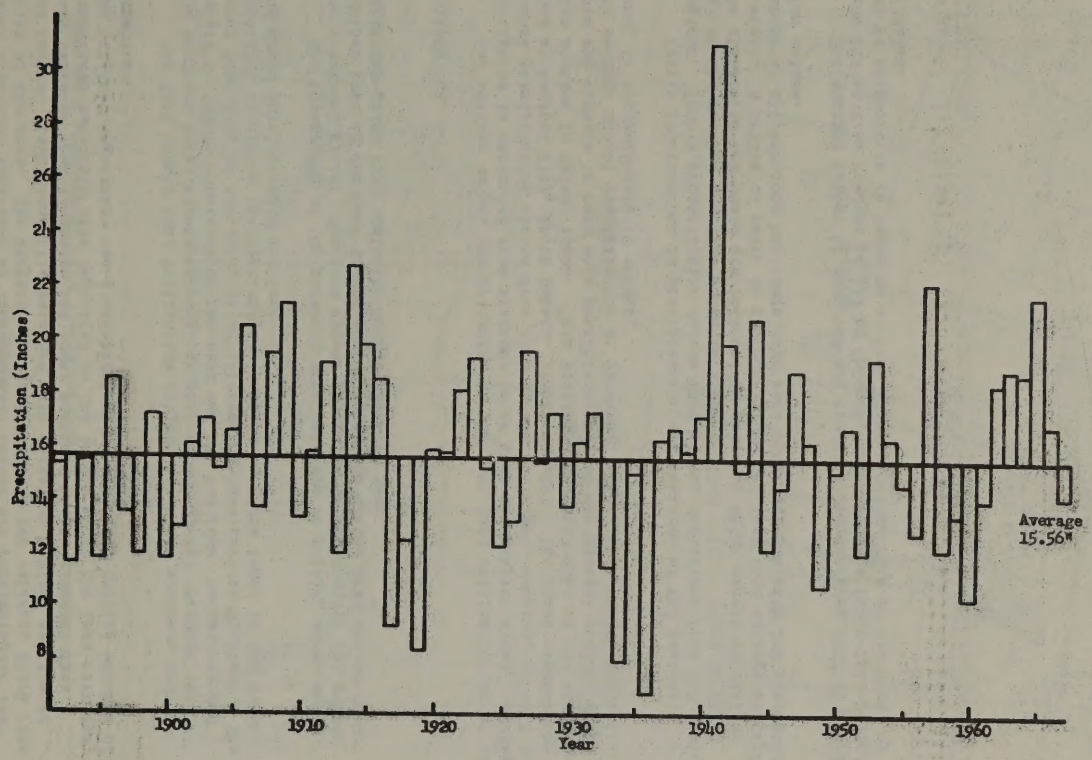

Figure XII-3 Average and Annual Precipitation at Dickinson, North Dakota.

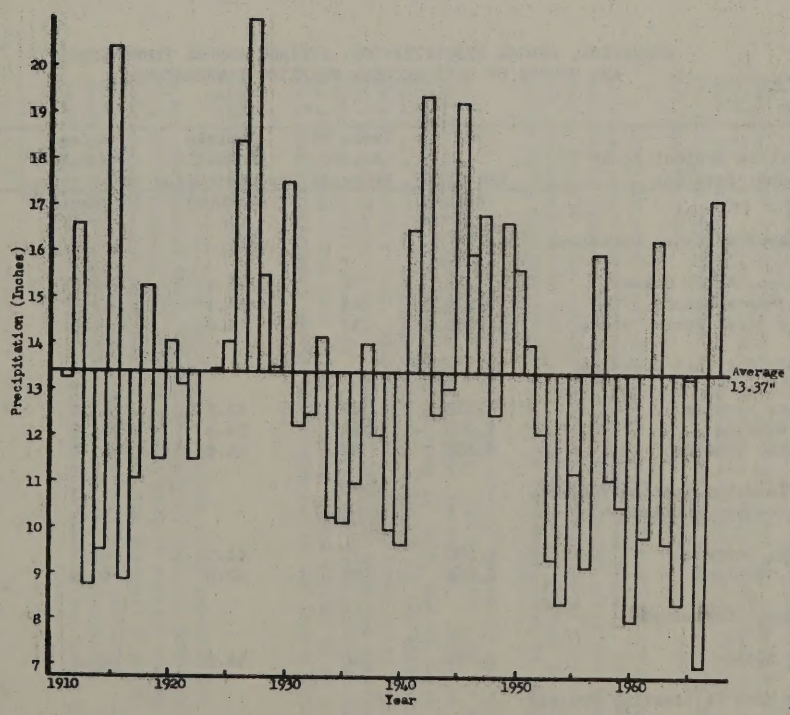

Figure XII-4 Average and Annual Precipitation at Douglas, Wyoming.

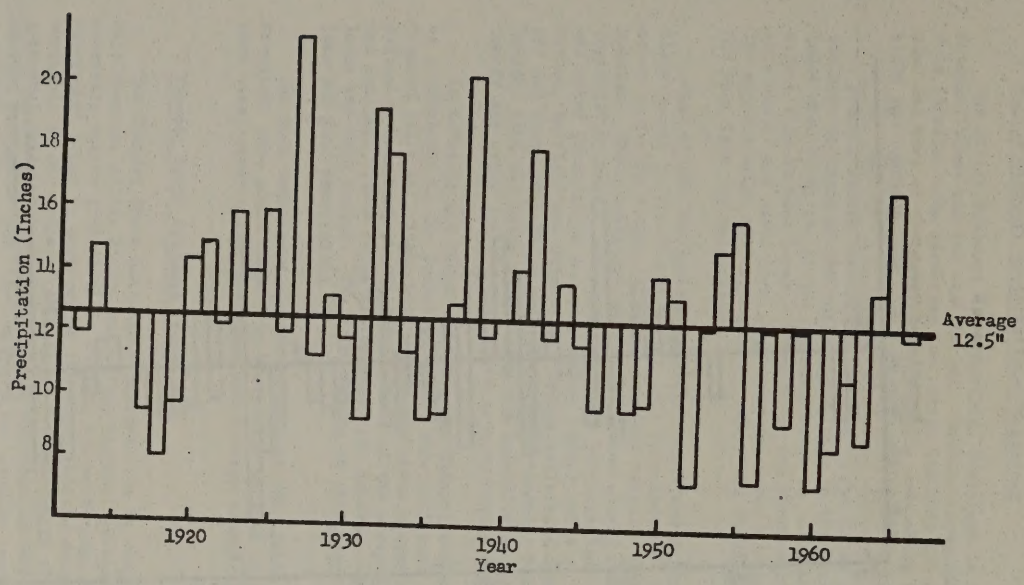

Figure VII-5 Average and Anual Precipitation at Chinook, Montana

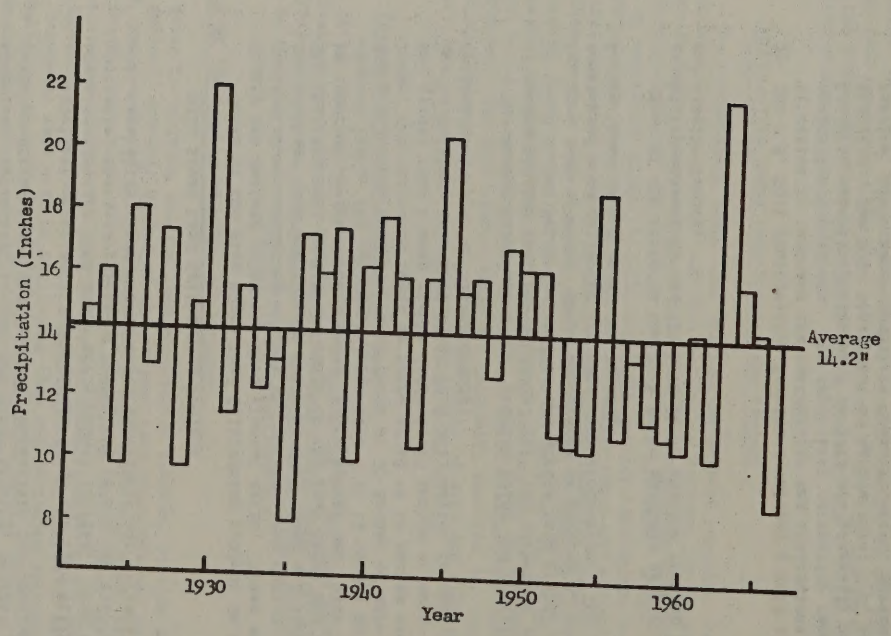

Figure VII-6 Average and Anual Precipitation at Malad, Idaho

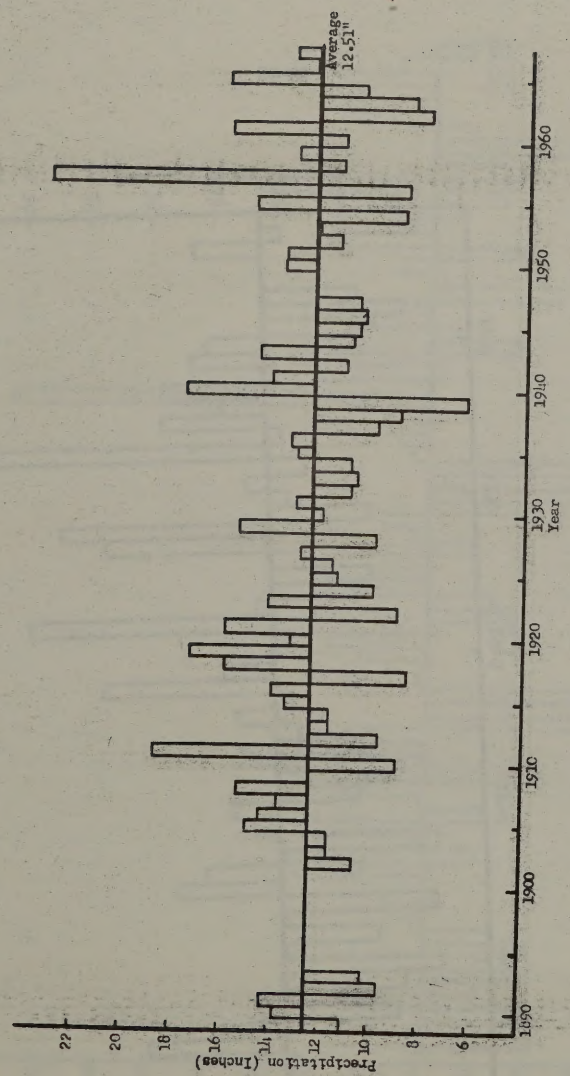

Figure VII-7 Average and Annual Precipitation at Taos, New Mexico.

Soils

Soils in the semi-arid region of the United States impose more restrictions on the variety of possible agricultural activities than do soils of the sub-humid and humid regions. There is less organic matter, depths to restrictive layers are shallower, and structural development is less pronounced. In sddition to climate and limited soil development, steepness of slope, susceptibility to wind and water erosion, salinity or adverse climatic conditions may limit the soil capability for cropland agriculture.

Evaluations of soil capabilities 3/ in the Land Utilization project areas examined in this study are somewhat limited. From the information available, the area purchased during the 1930's and 1940's was largely in soil capability classes considered unsuitable for dryland crop production.

Milk River Land Utilization Project

Soils of the Milk River Land Utilization project in northern Blaine County are derived primarily from glacial drift. These soils are characterized by an undulating surface and shallow lake depressions. Soils of the purchase area are largely Phillips Clay Loams and Scobey Loams. (7) The Phillips soil series are soils of the scab lands and are characterized by numerous depressed bare spots (slick spots) and "blow outs." On the heavier loams, the carbonate layer lies 8 to 12 inches below the surface and grades into heavy textured drift at 35 inches or more. On the lighter loams, the carbonate layer is found at 10 to 16 inches below the surface and grades into a more riable drift at 20 inches or more. Drainage is poor in the Phillips Loam series and this soil series is one of the marginal agricultural types in Blaine County.

The Scobey Loams are a dark grayish color and contain various amounts of coarse glacial till and boulders. (8) The carbonate zone is found at 10 to 16 inches below the surface and grades into gravel and boulder material at 4 feet or more. Where topography is favorable, the Scobey Loams are considered good soils for dry land crop production. The stony phase of the Scobey Loams is too rocky for farming.

Most of the soils in the Milk River purchase area would be placed in capability classes VI and VII because of shallow rooting zones, stoniness and erosion hazard.

3/ The U.S. Soil Conservation Service developed a soil capability classification to indicate the suitability and limitations of soil for agricultural purposes. The capability categories range from I to VIII. Soils in capability classes V to VIII are generally not suited to cultivation. See U.S. Department of Agriculture, U.S. Soil Conservation Service. 1961. Land-Capability Classification. Agriculture Handbook No. 210. 21 pages.

Little Missouri River National Grassland

The Little Missouri River National Grassland is drained by the Little Missouri River and its tributaries. Badland topography occurs over an area 8 to 15 miles wide bordering the Little Missouri River. (14) The plateau east and west of the Badlands is a gently undulating to rolling plain with hills and buttes capped with materials resistant to erosion.

A soils survey report of North Dakota published in 1968 (16) provides the best estimate of the soil capabilities in the Grassland area. The Badlands area along the Little Missouri River is hilly and steeply sloping with a thin surface layer. These soils are characterized by very high surface runoff and water loss, high wind and water erosion hazard, low fertility and low water holding capacity. They are rated unsuitable for cropland and only fair for pastureland.

East of the Badlands in Billings County and extending one-half through Slope County is the Rhodes-Morton Soil Association. Rhodes soils usually occur on gentle slopes spreading from the bases of hills, ridges and higher uplands. These soils are very old, layered clays, silt loams and soft shales deposited by water. They are generally poor cropland because of limited root and water penetration and poor tilth. Other soils in this association are Morton, Belfield and Bainville. Morton soils have a moderate surface runoff and water loss and a moderate erosion hazard. Belfield soils have limited root and water penetration and Bainville soils have high surface runoff and water loss, a high water erosion hazard and limited fertility.

In McKenzie and Slope Counties, the Bainville-Morton Soil Association is predominant in the Grassland area. This soil area consists of smoothly rounded hills and ridges with moderately steep slopes and a well-entrenched system of branching drainageways. Some of the steeper slopes are broken and gullied. These soils are on very old, layered, water-deposited silts, loams and soft shales. The soils making up this association are poor cropland but good pastureland.

The soil capability classes in most of the Little Missouri National Grassland area would range from VI to VIII because of shallow rooting zone, poor water penetration, steepness and erosion hazard.

Thunder Basin National Grassland

The Thunder Basin National Grassland area is drained by the Cheyenne, Bell Fourche, Little Powder and Little Missouri Rivers. The topography generally varies from level to rolling but some rough breaks and broken topography occur in portions of the area. Little detailed information is available on the soils of this area, but Dunnewarld (2) provided a map and a general description of soils within the state of Wyoming. Soils of the western portion of the Grassland area are usually found on undulating topography but rolling to steep phases of these soils occur. The carbonate layer may be found from the surface to 12 inches of depth. Shallow soils of medium to sandy texture are found in the eastern portion of the Thunder Basin

National Grassland. The topography here is generally undulating, but some rougher areas occur.

Two River Basin studies published by the U.S. Department of the Interior (24) show the soil capability classification of the public domain land surrounding the National Grassland. Most of the area adjacent to the Grassland area was found to be in class VI and VII and thus, suited primarily for grazing.

Southeastern Idaho Land Utilization Project

The Southeastern Idaho Land Utilization project purchase area is located primarily in the Black Pine and Curlew Valleys. Soils at the lower elevations and in the southern part of the project area are deep to moderately deep, well-drained soils on lake terraces. These soils are in capability class III (15) and their primary limitations to crop production are steepness of slope at the valley edges and susceptibility to wind and water erosion. Soils of the non-mountainous central and northern project area occur on the loess covered footslopes and lake terraces. These soils are deep to moderately deep and are suitable for cropland production. The main limitations are imposed by steepness of slope, moderate susceptibility to wind and water erosion, and climatic conditions. The mountainous soils are generally unsuited for cropland production because of stoniness, shallow depth of soil and steepness of slope. The soil capability class of these areas is VII.

Taos County Land Utilization Project

Little information is available on the soils of the Taos County Land Utilization project area. The fact that only a very small part (2 percent) of the area was being farmed at the time of purchase indicates that much of the area was unsuited for cropland agriculture.

Status of the Land at the Time of Purchase

Prior to carrying out the land acquisition program, problem areas were defined, economic status of the project area occupants was determined, assessments of soil and vegetation conditions were made, and the relationship or impact of the purchase program on nearby towns and cities was ascertained. (27) The preliminary and final proposal plans for purchase developed by the Resettlement Administration or Bureau of Agricultural Economics were used in developing this and following sections. Unfortunately, not all the areas examined had these reports available and the completeness of the reports varied among project areas.

One of the purposes of the purchase programs was to overcome the unsatisfactory land tenure patterns and provide areas of sufficient size for an economic livestock operation for residents remaining in the area.

It was intended to purchase the more strategically located tracts, especially those that could not be readily acquired by a lease arrangement, to make possible reshaping the size and character of the operating units. (9) For this reason and the necessity to reduce the population density, this acquisition program concentrated on acquiring privately-owned tracts.

Ownership of the lands purchased or land ownership patterns within the problem areas of the project areas investigated are presented in Table VII-30.

With the drop in agricultural prices following World War I and the realization that much of the land being dry farmed was unsuited for this use, many people abandoned their farms. Some of these were leased to adjacent owners or were used by others without lease arrangements. Mortgage companies foreclosed on many properties and other lands became the property of county and local governments because of tax delinquency. In the five Land Utilization project areas studied, 25 to 40 percent of the land was unoccupied or owned by non-residents. (Table VII-31) It is not possible to determine the percent of the land that had been abandoned, but occupancy or residency provide an index of the magnitude of this land status.

The relatively small amount of the problem areas that was classified as cropland, 3 to 25 percent (Table VII-31), indicates the general unsuitability and hazards of dryland farming in areas with less than 15 inches of annual precipitation and moderate to severe soil limitations.

Increasing tax delinquency on agricultural lands occurred during the late 1920's and early- to mid-1930's. Over-investment in land and machinery during the period of high farm prices before and after World War I, declining farm prices in the late 1920's and drought in the 1930's combined to place the landowner in a difficult position with regard to paying tax assessments. Estimates of tax delinquency ran as high as 97 percent in Billings County, North Dakota, in 1937. The values shown in Table VII-31 for the percent of the assessed acreage that was tax delinquent do not reflect the full extent of the problem. In an attempt to provide assistance to farmers, the state and Federal governments made money available in the form of seed loans, wheat benefit payments, emergency livestock payments, direct relief payments and other programs. This assistance probably made it possible for many to pay their taxes who would not have been able to do so from the earnings of the farm. Tax exempt lands in the form of unpatented homestead entries or land held by tax exempt war veterans prevented tax delinquency from being of greater magnitude than shown in Table VII-31.

Present ownership of the land in the purchase areas is shown in Figures VII-8 - 12. Privately-owned and state land are intermingled with the purchased lands. Most of the public lands administered by various agencies that were within the purchase area have been transferred to the agency presently in charge of the project area. Some of the state lands have been acquired by exchange or are leased by grazing associations.

TABLE VII-30

PERCENT OF LAND OWNED BY INDIVIDUALS, CORPORATIONS STATE AND LOCAL GOVERNMENTS, AND BANKS IN THE AREAS PURCHASED OR PROPOSED FOR PURCHASE

Location	Individuals	pora-tions	State Local Government	Banks & Mortgage Company	Total
Little Missouri National Grassland, North Dakota a/	79	15	4	2	100
Thunder Basin National Grassland, Wyoming	99	b/	1	b/	100
Milk River Land Utilization Project, Blaine County, Montana	72	9	1	18	100
Southeastern Idaho Land Utilization Project, Idaho	55	15	15	15	100
Taos County Land Utilization Project, New Mexico	100	0	0	0	100

a/ Ownership of land in proposed project areas LU-ND-38-21 and LU-ND-38-23.
b/ Corporations and banks not separated from individuals under private ownership category.

TABLE VII-31

LAND STATUS AT THE TIME OF PURCHASE
IN FIVE LAND UTILIZATION PROJECT AREAS a/

Land Utilization Project Area	Percent of Land		Percent of Land that was		Percent of Land Tax
	Occupied	Unoccupied	Cropland	Grazing	Delinquent
Little Missouri National Grassland, North Dakota	62	38	14	86	77-97
Thunder Basin National Grassland, Wyoming	b/72	b/28	10	90	d/ 31
Milk River Land Utilization Project, Blaine County, Montana	b/74	b/25	10	90	35-45
Southeastern Idaho Land Utilization Project, Idaho	c/	c/	25	75	67
Taos County Land Utilization Project, New Mexico	60	40	3	97	c/

a/ Values are estimates obtained from project proposals by the Resettlement Administration and Agricultural Experiement Station Bulletins.
b/ Values are for resident owned and non-resident owned land.
c/ Data not available.
d/ Data are for Weston County only. Tax delinquency in Niobrara County was approximately the same. Tax delinquency was less than one-half this value in Campbell and Converse Counties.

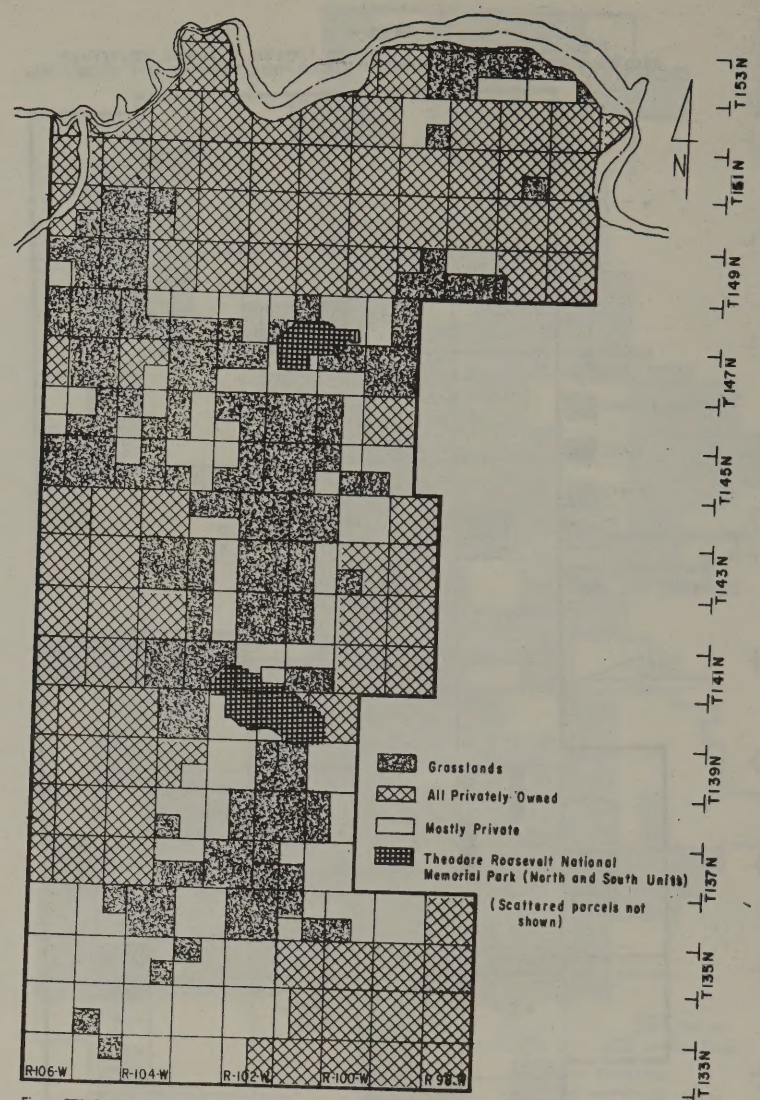

Figure VII 8 Land Ownership Within the Boundaries of LITTLE MISSOURI NATIONAL GRASSLAND in Western North Dakota.

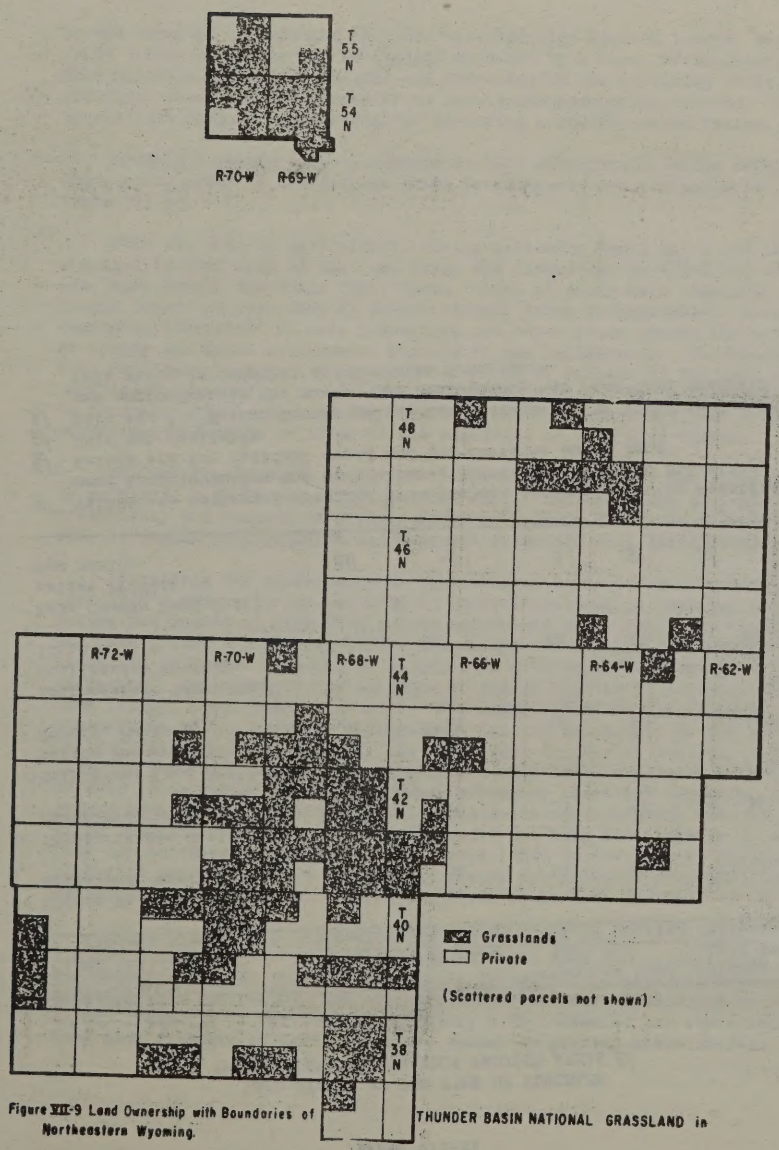

Figure VII-9 Land Ownership with Boundaries of THUNDER BASIN NATIONAL GRASSLAND in Northeastern Wyoming.

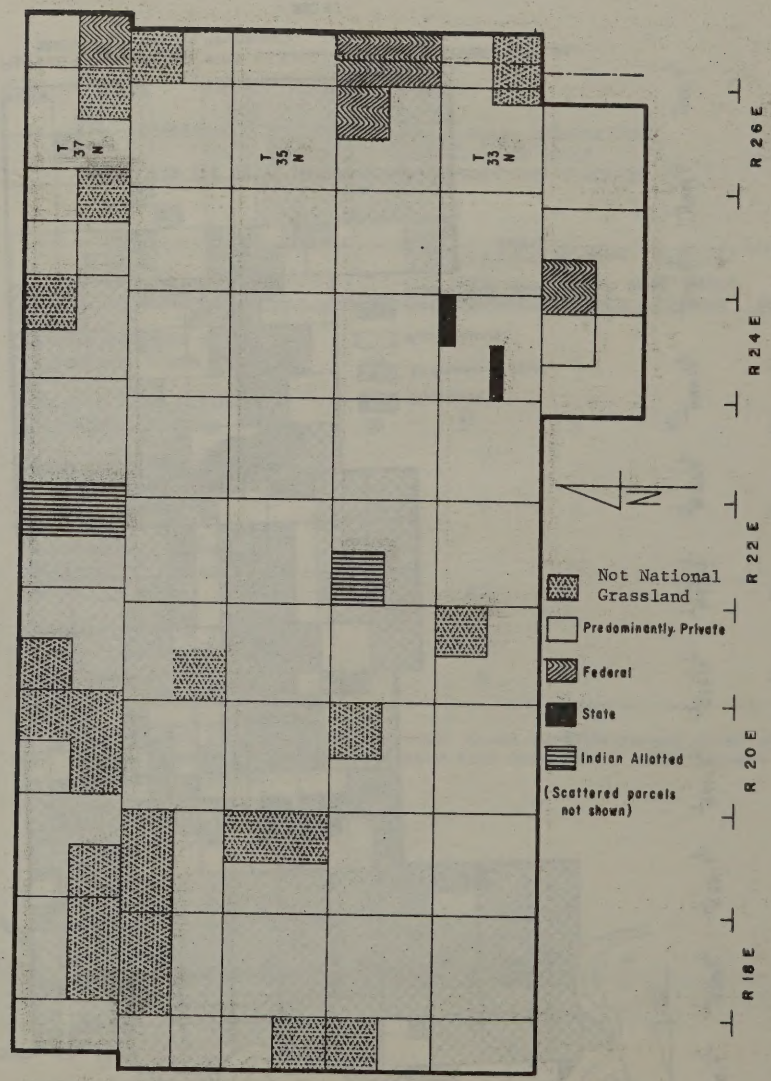

Figure VII-10 Land Ownership Within the Blaine County Area of the MILK RIVER LAND UTILIZATION Project in Northern Montana.

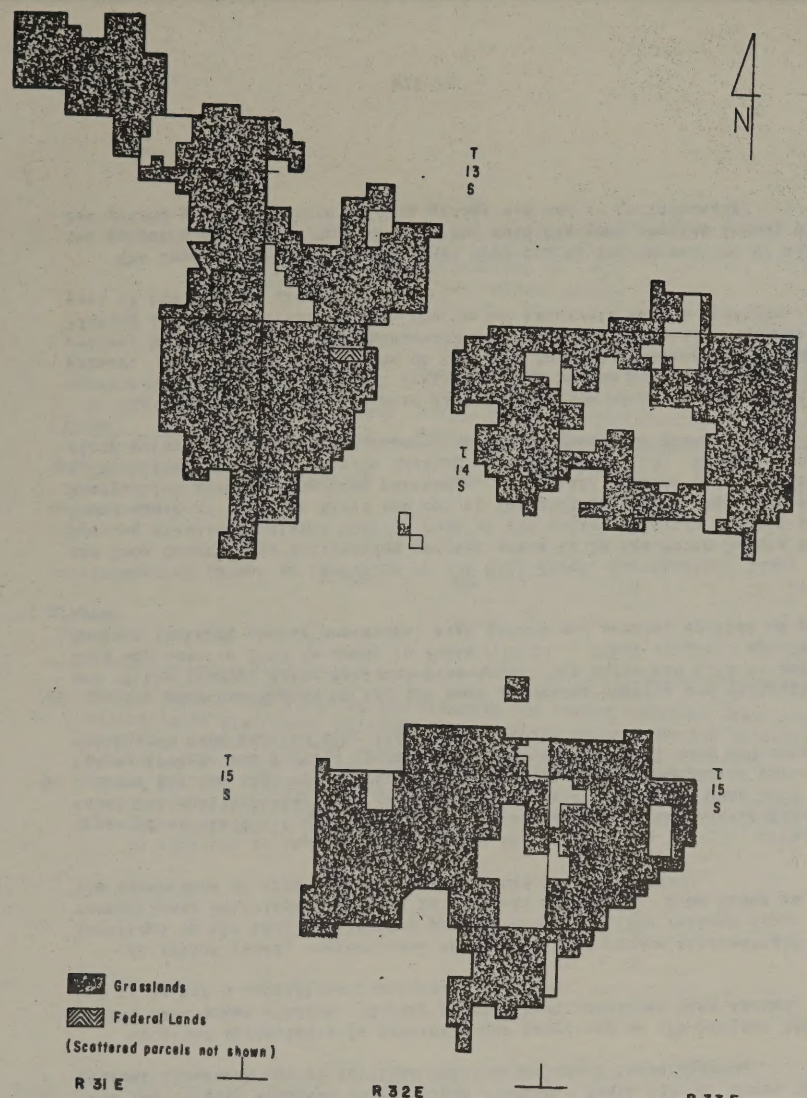

Figure VII-11 Land Ownership Within the Boundaries of the CURLEW NATIONAL GRASSLAND in Southeastern Idaho

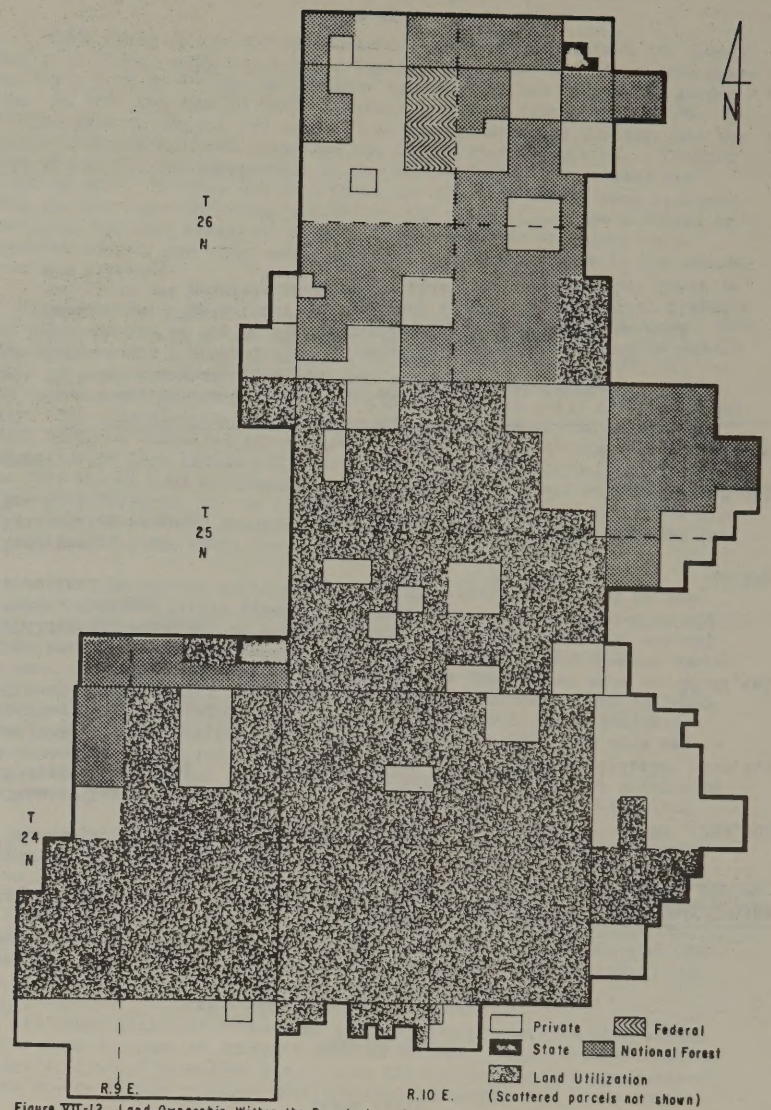

Figure VII-12 Land Ownership Within the Boundaries of the Taos County LAND UTILIZATION PROJECT in Northern New Mexico.

Present Uses and Products of the Land

One of the prime concerns in developing the land adjustment program for the northern Great Plains and the Intermountain Region was to change the land use from cropland agriculture to livestock ranching. This objective was largely achieved in the areas studied. Table VII-32 shows the present livestock use of the Land Utilization areas investigated.

Cropland agriculture is generally not permitted on the project lands in the five areas visited. Haying permits have sometimes been issued, but it is not a consistent practice.

In recent years, recreational activities have become increasingly important on the Land Utilization project areas. Of the various types of recreational activities, hunting is the most important. Some index to the importance of this activity is presented in Table VII-33.

In addition to the big game animals listed in Table VII-33, other types of wildlife occur. Bighorn sheep were planted on the Little Missouri National Grassland and are reported to be increasing. Game bird numbers include sage and sharptailed grouse, pheasants, Hungarian partridge, turkeys and several species of waterfowl. Several dams and reservoirs have been stocked with fish.

Big game hunting is by far the most important hunting and recreational use of the Thunder Basin National Grassland. The estimated kill of antelope and deer in 1967 is shown in Table VII-33. Other wildlife species include turkeys, chukar partridge, sage grouse and several species of waterfowl.

Hunting is not as important on the Milk River, Southeastern Idaho and the Taos County Land Utilization project areas as in the North Dakota and Wyoming areas. In Blaine County, much of the better wildlife habitat is found south of the Milk River and out of the project area. Sage grouse, sharptailed grouse, Hungarian partridge, cottontail rabbits and a variety of waterfowl, however, provide hunting opportunities. (13) Some of the stock water impoundments and reservoirs are stocked with fish.

Big game populations are more plentiful in the hills and mountains surrounding the Curlew National Grassland than in the grassland area proper. Upland game birds found on the area include mourning doves, sage grouse, Hungarian partridge, pheasants and Columbian sharptailed grouse. Fishing is a popular activity on the Curlew Reservoir in the southern part of the project area.

The Taos project offers the least opportunity for recreation of all the projects examined. Mule deer is the main big game species found; a few upland game birds such as blue grouse are hunted periodically.

TABLE VII-32

GRAZING USE
ON
FIVE LAND UTILIZATION PROJECT AREAS

Location	Year	Number Permittees	Number of Animal Unit Months: Cattle	Sheep a/	Total
Little Missouri National Grassland, North Dakota	1968	480	367,412	1,595	369,007
Thunder Basin National Grassland, Wyoming	1965	196	103,411	185,175	140,446
Milk River Land Utilization Project, Blaine County, Montana	1968	129			b/ 37,665
Southeastern Idaho Land Utilization Project, Curlew National Grassland c/	1968	64	29,955		29,955
Taos County Land Utilization Project, New Mexico	1968	12	1,395	7,625	9,011
Total		881	502,173	194,395	586,124

a/ Five sheep months equivalent to one animal unit month (AUM).
b/ Includes two sheep permits.
c/ Figures are for the Curlew National Grassland acreage and do not include use of the LU lands administered by the Bureau of Land Management. These lands are included as part of the Burley District and it is not possible to separate this use from the other lands in the district.

TABLE VII-33

ESTIMATED BIG GAME POPULATIONS OR KILLS
ON FIVE LAND UTILIZATION PROJECT AREAS

Kind of Animal	Little Missouri National Grassland N. Dakota a/	Thunder Basin National Grassland Wyoming b/	Milk River Land Utilization Project Blaine Co. Montana b/	Southeastern Idaho Land Utilization Project-Curlew Natl.Grassland a/	Taos Co. Land Utilization Project New Mexico a/
Mule Deer	6,900	2,100	44	300	300
White-Tail Deer	4,500	0	3	0	0
Antelope	1,700	3,600	68	0	10
Bighorn Sheep	105	0	0	0	0

a/ Data obtained from files in the McKenzie and Medora National Grassland Districts of the Custer National Forest, North Dakota; Curlew National Grassland District of the Caribou National Forest, Idaho; and the Supervisor's Office of the Carson National Forest New Mexico.

b/ Values are kill estimates and not total numbers. Figures supplied to the U.S. Forest Service and the Bureau of Land Management by the Fish and Game Departments of Wyoming and Montana.

Other types of recreation furnished by the areas examined are camping, picnicking, swimming, general sightseeing, etc. Only in recent years has there been an attempt to tabulate recreational use by type of activity. In 1967 the Thunder Basin National Grassland tabulated 482,000 visitor days of use for recreational purposes, including hunting, and the Little Missouri National Grassland had 42,900 visitor days use. Visitor days use at the two campgrounds on the Curlew National Grassland was 7,600 in 1967. Neither the Milk River nor the Taos County Land Utilization project areas offer the attraction for recreational use provided by the three National Grassland areas. These areas are not along well-traveled routes, and other areas nearby are more attractive to the recreationist.

As would be expected because of the nature of the project areas, timber production is of minor importance as a land use activity. The Little Missouri Grassland contains about 4,000 acres of ponderosa pine, 200 acres of limber pine and many thousand acres of scattered juniper, ash and cottonwood. Approximately 2,000 juniper and ash posts are sold annually. The approximately 32,000 acres of timber land on the Thunder Basin National Grassland are managed for their watershed and recreational values rather than commercial timber production. Pinon-juniper stands on the Taos County Land Utilization project area are more of a problem than a benefit. Clearing of the tree cover is proceeding in parts of the area as a range improvement practice. Some firewood is gathered from the land by residents of the small towns nearby.

Coal, gas and oil explorations are being actively pursued on the Thunder Basin and Little Missouri National Grasslands. A number of oil wells are in production on both Grasslands. In 1968 there were approximately 2,700 oil and gas leases, and 30 coal leases on the Thunder Basin National Grassland. Bentonite is mined in the Osage-Upton area and several uranium claims are located in the southwest corner of the National Grassland. Mineral leases and permits on the Thunder Basin National Grassland produced 144 thousand dollars revenue in 1967, and this was approximately 89 percent of the total revenue received in that year. Mineral leases produced approximately 81 percent of the total revenue of more than 1 million dollars on the Little Missouri National Grassland.

The Curlew, Little Missouri and Thunder Basin National Grasslands make an important contribution as demonstration areas for land use practices. Local and scientific groups visit these areas periodically to observe the programs of land use development. Personnel at the University of North Dakota have used the Little Missouri National Grasslands for numerous plant ecological studies since the 1930's. The Idaho Fish and Game Department and the Land Grant Institutions of Utah and Idaho make use of the Curlew National Grassland for scientific studies.

Although difficult to measure quantitatively, the watershed values of the Land Utilization projects studied is high. Water from the Little Missouri National Grassland drains into the Little Missouri and Yellowstone Rivers through various small streams and creeks and flows into

Garrison Reservoir on the Missouri River. Runoff water from the Thunder Basin National Grassland contributes to irrigation projects on the Belle Fourche and Cheyenne Rivers in South Dakota. Drainage from the project lands in Blaine County, Montana, flows into the Milk River, which provides irrigation water to areas along the river through several reservoir sites. The Taos County project contributes water to irrigation through the Chama and Rio Grande Rivers. Drainage from the Curlew National Grassland provides irrigation water for the southern part of the Curlew Valley served by the Curlew Reservoir.

Productivity Comparisons

Direct comparisons between the productivity of the lands purchased under the Land Utilization programs of the 1930's and 1940's and lands of other ownerships is difficult and only general comparisons can be made. During the homestead era, the better lands were generally selected for entry and the poorer lands remained in Federal ownership. Commonly, it was the worst of the farmland that reverted to county and local governments because of tax delinquency. Land that remained in private ownership in these Land Utilization project areas was, usually, of better quality than that which was purchased by the Federal government.

Based on carrying capacity of the range, the productivity of project lands in Blaine County, Montana, exceeds that of land under private, state, or Federal ownership. (Table VII-34)

The greater productivity of the project land than land in private ownership may be partly due to the range improvement program of artificial seeding and stock water development that occurred after the land was acquired by the Government rather than an inherently lower production potential for the private land.

The forage production of lands in other ownerships is higher than the acquired land in the Thunder Basin National Grassland project area. (Table VII-35) Some of the difference in acres per animal unit month on U.S. Forest Service administered land and land in other ownerships may be due to a more conservative attitude of the U.S. Forest Service in establishing stocking rates.

In the Curlew National Grassland of Idaho, a large portion of the acquired land has been planted to crested wheatgrass. These seedings are stocked at an average of 1.5 acres per animal unit month of grazing. Private land with the same vegetation has a comparable production. In that portion of the Southeastern Idaho Land Utilization project that was transferred to the Bureau of Land Management, forage production is much greater than on the private and state owned lands. The Bureau of Land Management had a very active range seeding program during the 1950's and 1960's in this area and the higher productivity of the project lands than lands of other ownership is primarily due to this program.

TABLE VII-34

FORAGE PRODUCTION, AS INDICATED BY LIVESTOCK CARRYING CAPACITY, OF LANDS IN DIFFERENT OWNERSHIPS, BLAINE COUNTY, MONTANA a/

Type of Ownership	Acres Per Animal Unit Month
Vacant Public Domain	6.80
State	5.16
Private	4.42
Land Utilization	4.07

a/ United States Department of the Interior, Bureau of Land Management. 1960. Land Planning and classification report of the public lands in the Milk River area, Montana. A Missouri River Basin Investigation. (163 pages plus appendices and maps) p. 29.

TABLE VII-35

FORAGE PRODUCTION, AS INDICATED BY LIVESTOCK CARRYING CAPACITY OF THE THUNDER BASIN NATIONAL GRASSLANDS AND LANDS IN OTHER OWNERSHIPS

Grassland Subdivision	Acres Per Animal Unit Month	
	National Grassland a/	Other Lands
Inyan Kara	4.4	b/ 3.0-3.3
Spring Creek	3.4	c/ 3.0
Thunder Basin	4.1	d/ 3.86
Total	4.1	e/ 2.5

a/ U.S. Forest Service. 1965. Thunder Basin National Grassland. Mimeographed Field Tour Report. Medicine Bow National Forest. Region Two, 9 pages.

b/ Estimates supplied by Agricultural Stabilization and Conservation Service, Douglas, Wyoming. Estimates from T40N, R68W, T41N, R68W; and T40N, R67W.

c/ Estimates supplied by Crook County Agricultural Stabilization and Conservation Service office, Sundance, Wyoming. Estimates from T49N, R63, 64, 65, 66W; T54N, R68W; and T55N, R68W.

d/ Estimates from Campbell County Agricultural Stabilization and Conservation office, Gillette, Wyoming. Value is an average of four privately owned ranches in T43N, R71W; T45N, R70W; and T43N, R72W.

e/ Clark, Richard and Andrew Vanvig. 1965. Wyoming farm and ranch land prices. Wyoming Agricultural Experiment Station. Mimeographed circular No. 215, p. 6.

Within the Taos County Land Utilization project are scattered tracts of private and state land. No statistical estimates of the relative production of the lands of different ownership are available. At the time of purchase, however, these privately-owned lands had been seriously overgrazed. (1) Adjustments in stocking rates after purchase by the Resettlement Administration, and range improvement and development work during the 1940's and 1950's increased forage productivity over adjoining lands in other ownerships. It was stated by a former U.S. Forest Service employee who was in charge of the purchased area from 1946 to 1952, that the project lands generally had a higher grazing capacity than the surrounding lands of other ownerships.

Grazing Privileges and Fees

Plans for the management of the acquired Land Utilization projects were developed early in the purchase program. It was realized that administration would be complicated by the intermingled lands of other ownerships in the purchase area (11) but earlier experience in Montana (18) indicated that cooperative grazing associations could be used as an effective means of bringing lands of diverse ownership under control. These cooperative grazing associations of livestock producers can lease or buy private and state land and use it under the same regulations as the public land.

The Taos County project is the only one of the five Land Utilization projects investigated that is not managed through some form of a cooperative grazing association. This project area was administered by the U.S. Forest Service with their rules and regulations soon after it was acquired by the Resettlement Administration.

The Grazing Association operates under a lease agreement with the administering agency. The lease agreement designates what each party will do with regard to management, improvements, trespass, records, etc.

The distribution of grazing privileges among applicants for use of the Land Utilization areas is based on prior use, dependency and commensurate property. The basis for distribution of privileges was determined by the original administering agencies, i.e., the Resettlement Administration or the U.S. Soil Conservation Service. These requirements were founded on the U.S. Forest Service and Taylor Grazing Act specifications and generally do not present any conflict now that these two agencies are administering the Land Utilization projects examined in this study. There is, however, a deviation from previous U.S. Forest Service regulations for national forests in the case of the McKenzie County Grazing Association in North Dakota. The U.S. Forest Service rules specify that to be eligible for a grazing permit, the applicant must own the commensurate property and the animals. (25) An agreement was reached between the U.S. Forest Service and the McKenzie Association in which "share" cattle may be grazed under the permittee's license. This would allow a son or hired man to own some livestock and graze on National Grassland under the landowner's permit. (12)

One of the purposes of the Land Utilization program was to provide farmers and ranchers remaining in the area with access to a sufficient amount of grazing land to form an economically sound unit. Upper limits were placed on the number of stock owned by one member that could use the association-controlled lands so that, as additional forage was developed, the smaller operators could be encouraged to increase to an economic size. Upper limits vary from 200 animal units in the Curlew National Grassland to 350 animal units in the Little Missouri National Grassland.

Grazing charges by the federal agencies for use of the Land Utilization project areas were generally established during the period of administration by the U.S. Soil Conservation Service. Fees are adjusted yearly using a base rate for each project area and the relationship of the previous year's livestock prices to a base livestock rate. The base fee rate was established in the late 1940's from studies on the value of the grazing privileges granted. Costs of required management and conservation practices were considered in establishing the fee rates. The base livestock fee was derived from livestock prices in the 15 western states during the period 1937-1946. (19) In addition to the federal charge made for the use of the public lands in Land Utilization project areas, the Grazing Association assesses its members a yearly charge per animal unit month of use. The association charges are levied to cover the cost of administration, range improvements and operating expenses, such as the cost of salt, mineral supplements, water hauling if necessary, and other items. The 1966 fees for the Land Utilization projects are presented in Table VII-36. The U.S. Forest Service in Wyoming and North Dakota and the Bureau of Land Management in Montana bill and issue licenses directly to the Grazing Associations. Members of the two associations on the Curlew National Grassland are licensed individually by the U.S. Forest Service.

A Farmer's Home Administration Cooperative Grazing Association was formed in 1967 and makes use of the Little Missouri National Grassland. This association charges its members $4.50 per animal unit month for grazing permits.

Causative Factors Leading to the Land Purchase Program

Land disposal programs and policies of the Federal government after the mid-nineteenth century contributed substantially to the agricultural and land use problems that came sharply into focus during the 1930's.

Settlement of the area west of the Mississippi River was stimulated in the late 1800's because of expanding populations in the eastern states, discovery of precious minerals in western states, and the development of a transportation system across the country. Confinement of the plains and Western Indian tribes to reservation areas also made settlement of the west more appealing.

TABLE VII-36

FEDERAL AND GRAZING ASSOCIATION CHARGES
PER ANIMAL MONTH OF GRAZING ON LAND UTILIZATION PROJECTS

Land Utilization Areas and Grazing Associations	Charge/AUM of Grazing, 1966			
	Base Fees	Federal Fees	Assoc. Fees	Total Fees
Little Missouri National Grassland				
Medora Grazing Association	$0.19	$0.49	$0.59	$1.08
Little Missouri Grazing Assoc.	0.19	0.49	0.57	1.06
McKenzie Grazing Association	0.19	0.49	0.11	0.60
Thunder Basin National Grassland				
Spring Creek Association	0.21	0.54	0.00	0.54
Inyan Kara Association				
Individual Allotments	0.21	0.54	0.07	0.61
Community Pastures a/	0.21	0.54	0.17-.32	.71-.86
Thunder Basin Association				
Individual Allotments	0.21	0.54	0.02	0.56
Community Pastures a/	0.21	0.54	0.30-.82	.84-1.36
Milk River LU Project, Blaine County				
Cherry Ridge Association	0.22	0.57	0.01	0.58
North Fork Association	0.22	0.57	0.06	0.58
Lohman Association				
Individual Allotments	0.22	0.57	0.06	0.63
Community Allotments	0.22	0.57	0.55	1.12
Coal Creek Association	0.22	0.57	0.03	0.60
Wayne Creek Association	0.22	0.57	b/ --	b/ 0.50
Southeastern Idaho LU Project				
Curlew National Grassland				
Curlew Cattle and Horse Assn.	0.26	0.66	0.60	1.26
Pleasant View Association	0.26	0.66	2.00	2.66
BLM Administered Land	0.22	0.33	0.00	0.33
Taos County LU Project c/				
Sheep (per sheep month)	0.0275	0.07	[illegible]	[illegible]
Cattle	0.1050	0.33	[illegible]	[illegible]
Horses	0.13	0.41	--	0.41

a/ Each community pasture or allotment may have a different rate because of difference in the costs of using these pastures.

b/ The total fee charge for the use of land controlled by the Wayne Creek Association is less than the federal fee of 57 cents. This results because of the public domain intermingled with the Land Utilization Project lands. The federal fee for public domain land was 33 cents in 1966.

c/ There is no grazing association in this area.

To encourage and facilitate the western migration, large checkerboard land grants were made to railroad companies for construction of a transportation system across the country and free parcels of land were made available to settlers under various Homestead Acts. Grants of land were also made to the states for educational and other purposes. From these land policies emerged a land ownership pattern that contributed to later problems in land utilization.

Under the various Homestead Acts, title could be obtained to tracts ranging in size from 160 to 640 acres. In some areas, land could be homesteaded under more than one act, but seldom was it possible to obtain more than 960 acres.

Farmers learned to make the treeless prairies of the eastern plains productive cropland. Success, in this area, on 160-acre homesteads prompted western expansion. Progressing westward across the Great Plains, the prairie grasses become shorter in stature. As settlement passed from the tall and mid-grass prairies in the east and central sections to the western short-grass plains, the transition from a humid and sub-humid climate to a semi-arid climate occurred. Settlers also encountered a semi-arid environment in the Intermountain Region west of the plains. Characteristic of the semi-arid climate is the variability in amount of precipitation that is received from year to year. Moist years alternate in an irregular pattern with years of drought. The climate may be humid, as in 1905, or as dry as that of a desert, as in 1910. (10) Under this regime of climatic conditions, soils have limited development and are only held in place by the vegetational cover. When the natural cover is broken by the plow, wind and water move unprotected soil particles from one area to another. Small grains such as wheat are generally grown where the annual precipitation is more than 15 inches and this amount is greater than the average received in most of the semi-arid areas.

Surges of settlement and withdrawal from the semi-arid areas of the west followed the climatic cycles that occurred in the late 1800's and early 1900's. Despite difficulties encountered, the number of farms increased through the early 1920's. High prices for farm commodities, favorable weather, the development of special dry farming methods, and the development of mechanical methods for harvesting wheat were contributing factors. Favorable economic and climatic conditions in the period preceding and following World War I caused farmers to mortgage their farms so as to purchase additional land and equipment. As production of farm products increased, prices dropped and the normal productivity of these semi-arid regions was not sufficient to carry the heavy mortgage and tax loads that developed during the previous period. When drought conditions occurred in the 1930's and added to the problems of low prices and over-investment, collapse was inevitable.

Also adding to the problems of agriculture in the 1930's was the speculation in land that occurred preceding and following World War I. The general desire to own land brought people to the semi-arid farming areas who were poorly equipped, by knowledge and experience, to be successful farmers in even the more favorable locations. War veterans were

encouraged to homestead land for speculative purposes, since some states provided them with varying amounts of tax exemption.

The previously described events all contributed to the need for land use adjustments that were undertaken by the Federal purchase program in the 1930's. In summary, attempts at cropland agriculture in an environment unsuited for such agricultural activities, land disposal policies which did not provide sufficient acreage to permit the development of an economically sized range livestock economy for which the areas were suited, and the creation of a land ownership pattern that stifled adjustments in agriculture needed to adapt to the semi-arid and arid environments combined to create the land use problems which the Federal government attempted to alleviate with the Land Utilization program.

A considerable portion of the areas studied could be put into cropland agriculture if irrigation water were available. Without water for irrigation, climate and soil are limiting to cropland agriculture, except in a few areas. With these limitations, advances in the breeding of more drought and disease resistant varieties of crops, use of fertilizers and the development of sophisticated farm machinery only lessen slightly the hazards of dry land farming in areas of less than 15 inches of precipitation.

The availability of water to irrigate the land, however, makes it possible to overcome the climatic limitations, and modify, to some extent, the soil characteristics which impose limitations, in addition to those of climate, on dry land farming.

With the rapid spread of electrical power facilities into rural areas during the 1940's, pump irrigation became possible in some localities. Several thousand acres of land in the Curlew National Grassland could be irrigated through this means if it were necessary or desirable to do so. An additional area, south of the Curlew Reservoir, could be irrigated with water from the reservoir.

The depth to water in the Blaine and Taos County Land Utilization projects, and the Thunder Basin and Little Missouri National Grasslands is such that pump irrigation is not feasible except at a few locations. Large, and probably expensive, reclamation projects, however, would permit large parts of these areas to be irrigated.

The use to which lands in private ownership are put is largely regulated by economic opportunity. High prices for cereal or other cash crops will tend to cause more land to be put to this use. Declining prices cause shifts to alternative types of agriculture production. When such shifts are from grazing or pasture land to the production of cash crops, problems arise. It is relatively easy to shift from grazing land to cropland agriculture but the shift back from cash crops to permanent pasture or native vegetation is not easily accomplished - at least from the farmers' point of view. In view of this and the present surplus crop and farming acreages, it would appear that the present

Land Utilization areas should be considered as investments in conservation of land for future agricultural production. The type of production could then be determined at the appropriate time on the basis of existing needs.

In addition to range livestock production, the Land Utilization project areas provide other values to the public such as hunting, fishing and other forms of recreation. Because of the hazardous conditions under which cropland agriculture would have to operate, and the more than abundant supply of small grain crops, the present uses of the Land Utilization projects studied appear to be most desirable.

Reference Material

Chapter VII - Section A
Land Utilization Projects

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Labor Force - Table VII-37

Procedure

Agricultural Sector. The 1964 Census of Agriculture was used as the data source for the agricultural sector. The main difficulty with it, as with using a secondary source, is that it does not publish data in exactly the way that was required. Data was compiled for two types of livestock operations as defined in the Census. These operations had sales of livestock or livestock products amounting in value to 50 percent or more of the total value of all farm products sold during the year. The first type, livestock farms other than dairy and poultry, included farms that produce cattle, calves, hogs, sheep, goats, wool, and mohair except for farms in the 17 western states, Louisiana, Florida, Hawaii, and Alaska that qualified as livestock ranches. The second type, livestock ranches, were those operations in the same states whose sales of livestock, wool, and mohair represented 50 percent or more of the total value of farm products sold and if pastureland or grazing land amounted to 100 or more acres and was ten or more times the acreage of cropland harvested. As can be seen by the above definitions, the Census data does not restrict itself to range operations. Included in the data are hog operations. Suitable data was not available to exclude this portion of the economy. Fortunately, particularly for the livestock ranches, hog numbers are relatively small in comparison to total livestock so the error is not great. In addition, livestock other than poultry and dairy undoubtedly includes livestock feeding operations that could not be removed.

Because of the above factors, the data was compiled separately for each type of livestock operation as well as together. For the livestock operations this data was taken from the 1964 Census of Agriculture. The major limitation was the period of the year, November-December, that the data was taken. The Census reports the family and hired labor that was working on the farm in the week preceding enumeration. Most range livestock operations require seasonal labor in the summer months, whereas by November and December the labor force is usually minimal because the primary function is wintering the livestock. Thus, family and hired labor may be underestimated. For every farm, the labor of the farm operator was assumed to be fully available. This may be an overestimation.

For each type of livestock operation reported there are two major types of farms: commercial and other farms (part-time, part-retirement, and abnormal). The data presented in the final table for each type of operation represents the total labor force on both the commercial and other farms. For each type of farm, commercial and other farms (part-time, part-retirement, and abnormal) the labor of one farm operator was assumed to be available for every farm. In addition, the labor supplied by both family and hired labor that was reported as working more than or less than 15 hours in the week preceeding enumeration was also included.

TABLE VII - 37 LABOR FORCE 1963

IND. CODE	INDUSTRY GROUP	MONTANA	IDAHO	WYOMING	COLORADO
20	FOOD & KINDRED PRODUCTS A/	4,048	9,881	1,504	18,597
21	TOBACCO MANUFACTURERS A/	-	-	-	-
22	TEXTILE MILL PRODUCTS A/	-	-	-	C/
23	APPAREL & RELATED PRODUCTS A/	C/	30	C/	1,776
24	LUMBER & WOOD PRODUCTS A/	8,297	10,288	947	2,386
25	FURNITURE & FIXTURES A/	58	103	C/	1,060
26	PAPER & ALLIED PRODUCTS A/	C/	969	-	1,149
27	PRINTING & PUBLISHING A/	1,517	1,360	695	7,618
28	CHEMICAL & ALLIED PRODUCTS A/	278	3,232	52	1,694
29	PETROLEUM & COAL PRODUCTS A/	841	C/	2,127	925
30	RUBBER & PLASTICS PRODUCTS A/	C/	C/	C/	C/
31	LEATHER & LEATHER PRODUCTS A/	C/	50	-	C/
32	STONE, CLAY & GLASS PRODUCTS A/	858	775	632	4,856
33	PRIMARY METAL INDUSTRIES A/	3,261	1,179	-	7,642
34	FABRICATED METAL PRODUCTS A/	282	444	138	4,183
35	MACHINERY, EXCEPT ELECTRICAL A/	106	556	74	5,172
36	ELECTRICAL MACHINERY A/	-	C/	C/	3,486
37	TRANSPORTATION EQUIPMENT A/	76	812	C/	C/
38	INSTRUMENTS & RELATED PRODUCTS A/	81	C/	C/	872
39	MISCELLANEOUS MANUFACTURING A/	165	253	C/	1,586
19	ORDNANCE & ACCESSORIES A/	-	C/	-	C/
	ALL INDUSTRIES, TOTAL A/	20,247 D/	30,487 D/	6,797 C	93,722 D/
	OTHER FARMS IN THE STATE E/	26,930	41,616	6,124	28,580
	SUM OF LIVESTOCK FARMS & RANCHES	25,908	16,090	12,646	27,145
	LIVESTOCK FARMS F/	15,638	13,587	6,714	18,106
	LIVESTOCK RANCHES G/	10,270	2,503	5,932	9,039

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TABLE VII - 37 LABOR FORCE 1963, Continued

IND. CODE	INDUSTRY GROUP	NEW MEXICO	ARIZONA	UTAH	NEVADA
20	FOOD & KINDRED PRODUCTS A/	3,595	6,597	8,463	1,011
21	TOBACCO MANUFACTURERS A/	-	-	-	-
22	TEXTILE MILL PRODUCTS A/	C/	C/	344	-
23	APPAREL & RELATED PRODUCTS A/	317	2,647	2,118	11
24	LUMBER & WOOD PRODUCTS A/	2,134	3,022	935	359
25	FURNITURE & FIXTURES A/	292	872	782	76
26	PAPER & ALLIED PRODUCTS A/	C/	C/	343	C/
27	PRINTING & PUBLISHING A/	1,469	4,121	2,697	1,171
28	CHEMICAL & ALLIED PRODUCTS A/	248	854	773	849
29	PETROLEUM & COAL PRODUCTS A/	504	69	1,000	C/
30	RUBBER & PLASTICS PRODUCTS A/	C/	C/	503	-
31	LEATHER & LEATHER PRODUCTS A/	C/	C/	C/	-
32	STONE, CLAY & GLASS PRODUCTS A/	1,353	3,165	2,663	1,340
33	PRIMARY METAL INDUSTRIES A/	C/	4,480	7,502	1,072
34	FABRICATED METAL PRODUCTS A/	334	2,577	2,639	233
35	MACHINERY, EXCEPT ELECTRICAL A/	635	5,771	3,150	100
36	ELECTRICAL MACHINERY A/	378	9,131	1,672	267
37	TRANSPORTATION EQUIPMENT A/	128	5,784	12,717	15
38	INSTRUMENTS & RELATED PRODUCTS A/	C/	C/	C/	-
39	MISCELLANEOUS MANUFACTURING A/	C/	471	650	215
19	ORDNANCE & ACCESSORIES A/	C/	C/	C/	-
	ALL INDUSTRIES, TOTAL A/	15,324 D/	57,039 D/	53,504 D/	6,768 D/
	OTHER FARMS IN THE STATE E/	11,064	7,032	16,960	1,667
	SUM OF LIVESTOCK FARMS & RANCHES	11,283	5,339	10,556	2,257
	LIVESTOCK FARMS F/	3,358	1,910	8,061	1,610
	LIVESTOCK RANCHES G/	7,925	3,429	2,495	647

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TABLE VII-37 LABOR FORCE 1963, Continued

IND. CODE	INDUSTRY GROUP	WASHINGTON	OREGON	CALIFORNIA
20	FOOD & KINDRED PRODUCTS A/	26,704	19,938	155,731
21	TOBACCO MANUFACTURERS A/	-	-	50
22	TEXTILE MILL PRODUCTS A/	C/	2,277	6,805
23	APPAREL & RELATED PRODUCTS A/	4,134	2,644	63,559
24	LUMBER & WOOD PRODUCTS A/	42,440	69,975	51,906
25	FURNITURE & FIXTURES A/	2,473	2,429	32,125
26	PAPER & ALLIED PRODUCTS A/	17,985	6,781	28,865
27	PRINTING & PUBLISHING A/	8,469	5,311	74,407
28	CHEMICAL & ALLIED PRODUCTS A/	10,908	1,541	35,703
29	PETROLEUM & COAL PRODUCTS A/	1,391	358	19,017
30	RUBBER & PLASTICS PRODUCTS A/	490	409	29,275
31	LEATHER & LEATHER PRODUCTS A/	334	290	5,683
32	STONE, CLAY & GLASS PRODUCTS A/	5,357	2,955	45,637
33	PRIMARY METAL INDUSTRIES A/	9,768	4,491	48,469
34	FABRICATED METAL PRODUCTS A/	6,021	4,938	88,535
35	MACHINERY, EXCEPT ELECTRICAL A/	7,011	5,575	93,303
36	ELECTRICAL MACHINERY A/	2,693	5,759	187,965
37	TRANSPORTATION EQUIPMENT A/	72,402	5,055	202,090
38	INSTRUMENTS & RELATED PRODUCTS A/	C/	903	22,464
39	MISCELLANEOUS MANUFACTURING A/	1,796	1,493	24,650
19	ORDNANCE & ACCESSORIES A/	-	20	136,447
	ALL INDUSTRIES, TOTAL A/	224,375 D/	145,164 D/	1,398,611 D/
	OTHER FARMS IN THE STATE E/	56,844	46,234	98,614
	SUM OF LIVESTOCK FARMS & RANCHES	26,132	25,850	28,716
	LIVESTOCK FARMS F/	22,894	20,498	19,402
	LIVESTOCK RANCHES G/	3,238	5,352	9,314

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TABLE VII-37, Continued

LABOR FORCE FOOTNOTES

A/ 1963 Census of Manufacturers, U.S. Department of Commerce, Bureau of the Census.

B/ (Not used)

C/ The Bureau of the Census did not publish the data for this industry because it would have released information about a specific firm.

D/ The all industries total exceeds the sum of the column because it includes the number of employees that are in the type of manufacturers for which data was not released due to disclosure of information about an individual firm.

E/ 1964 Census of Agriculture, U.S. Department of Commerce, Bureau of the Census, to obtain labor force on total farms in the state. The data was modified by the Index of Total Farm Employment published in Farm Labor, U.S.D.A., S.R.S., C.R.B. Labor on "Other Farms in the State" was obtained by subtracting "Livestock Farms and Ranches" from "Other Farms in the State".

F/ Ibid. Livestock farms, excluding poultry and dairy, as defined in the 1964 Census of Agriculture. The total labor force includes the farm operator's labor plus any family or hired labor that were working more than or less than 15 hours per week on the farm during the week preceding enumeration. The data is for both commercial and other farms (part-time, part-retirement, and abnormal) except for Arizona where data was available for commercial farms only.

G/ 1964 Census of Agriculture, op. cit., and Farm Labor, op. cit. Livestock ranches as defined in the 1964 Census of Agriculture. The total labor force includes the farm operator's labor plus any family or hired labor that were working more than or less than 15 hours per week on the farm during the week preceding enumeration on both commercial and other farms (part-time, part-retirement, and abnormal).

Also, the data was tabulated for the sum of the two types of livestock operations. Similar data was also tabulated for the entire state.

Because the Census of Manufacturers was taken in 1963 and the Census of Agriculture occurred in 1964, it was necessary to convert the data to the common base year, 1963, for comparison purposes. A conversion factor, 1.0617, was calculated from the Index of Total Farm Employment and applied to the various 1964 agricultural sector labor forces.

Other Major Industries. The 1963 Census of Manufacturers served as the data source for the total number of employees working for each type of industry. The figure represents the total number of "full-time and part-time employees on the payrolls of" operating manufacturing establishments who worked or received pay for any part of the pay period which included the 12th and ended nearest the 15th of the month specified on the report form. Officers of corporations are included as employees; proprietors and partners of unincorporated firms, however, are excluded from the total.

Value Added - Table VII-38

Procedure

Agricultural Sector. The 1964 Census of Agriculture served as the data source for the agricultural sector. Data was compiled for two types of livestock operations as defined in the Census. These operations had sales of livestock or livestock products amounting in value to 50 percent or more of the total value of all farm products sold during the year. The first type, livestock other than dairy and poultry, included farms that produce cattle, calves, hogs, sheep, goats, wool, and mohair, except for farms in the 17 western states, Louisiana, Florida, Hawaii, and Alaska that qualified as livestock ranches. The second type, livestock ranches were those operations in the above states whose sales of livestock, wool and mohair represented 50 percent or more of the total value of farm products and if pastureland or grazing land amounted to 100 or more acres and was ten or more times the acreage of cropland harvested. As can be seen by the above definitions the Census data does not restrict itself to range operations. Included in the data are hog operations. Suitable data was not available to exclude this portion of the economy. Fortunately, particularly for the livestock ranches, hog numbers are relatively small in comparison to total livestock so the error is not great. In addition, livestock other than poultry and dairy, undoubtedly includes livestock feeding operations that could not be removed.

Because of the above factors the data was compiled separately for each type of livestock operation as well as together. In addition, data was compiled for all farms in the state.

TABLE VII - 38
VALUE ADDED 1963
($1,000)

IND. CODE	INDUSTRY GROUP	MONTANA	IDAHO	WYOMING	COLORADO
20	FOOD & KINDRED PRODUCTS A/	47,544	111,086	17,088	252,251
21	TOBACCO MANUFACTURERS A/	-	-	-	-
22	TEXTILE MILL PRODUCTS A/	-	-	-	C/
23	APPAREL & RELATED PRODUCTS A/	C/	C/	C/	8,602
24	LUMBER & WOOD PRODUCTS A/	70,670	88,581	6,861	14,612
25	FURNITURE & FIXTURES A/	C/	843	C/	9,577
26	PAPER & ALLIED PRODUCTS A/	C/	C/	-	13,363
27	PRINTING & PUBLISHING A/	12,136	16,119	6,093	75,559
28	CHEMICAL & ALLIED PRODUCTS A/	5,231	75,193	717	43,926
29	PETROLEUM & COAL PRODUCTS A/	C/	C/	37,222	16,732
30	RUBBER & PLASTICS PRODUCTS A/	C/	C/	C/	C/
31	LEATHER & LEATHER PRODUCTS A/	C/	C/	-	C/
32	STONE, CLAY, & GLASS PRODUCTS A/	11,935	8,358	8,885	61,530
33	PRIMARY METAL INDUSTRIES A/	47,795	C/	-	91,813
34	FABRICATED METAL INDUSTRIES A/	3,184	6,218	971	46,976
35	MACHINERY, EXCEPT ELECTRICAL A/	944	5,050	809	65,722
36	ELECTRICAL MACHINERY A/	-	C/	C/	43,322
37	TRANSPORTATION EQUIPMENT A/	C/	5,394	C/	C/
38	INSTRUMENTS & RELATED PRODUCTS A/	C/	C/	C/	9,139
39	MISCELLANEOUS MANUFACTURING A/	1,964	1,720	C/	12,497
19	ORDNANCE & ACCESORIES A/	-	C/	-	C/
	ALL INDUSTRIES, TOTAL A/	236,230 C/	366,411 D/	81,673 D/	1,193,628 D/
	OTHER FARMS IN THE STATE E/	132,813	217,213	22,080	128,059
	SUM OF LIVESTOCK FARMS & RANCHES	94,339	44,683	54,594	85,409
	LIVESTOCK FARMS F/	45,891	33,851	21,009	56,059
	LIVESTOCK RANCHES G/	48,448	10,832	33,585	29,350

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TABLE VII - 38, Continued
VALUE ADDED 1963
($1,000)

IND. CODE	INDUSTRY GROUP	NEW MEXICO	ARIZONA	UTAH	NEVADA
20	FOOD & KINDRED PRODUCTS A/	34,537	78,150	99,108	11,510
21	TOBACCO MANUFACTURERS A/	-	-	-	-
22	TEXTILE MILL PRODUCTS A/	C/	C/	1,911	-
23	APPAREL & RELATED PRODUCTS A/	1,673	12,604	9,117	C/
24	LUMBER & WOOD PRODUCTS A/	13,606	24,997	6,052	4,655
25	FURNITURE & FIXTURES A/	1,283	6,609	5,363	C/
26	PAPER & ALLIED PRODUCTS A/	C/	C/	C/	C/
27	PRINTING & PUBLISHING A/	14,236	44,874	31,360	12,225
28	CHEMICAL & ALLIED PRODUCTS A/	2,826	16,469	9,385	22,273
29	PETROLEUM & COAL PRODUCTS A/	10,351	1,249	25,238	C/
30	RUBBER & PLASTICS PRODUCTS A/	C/	C/	C/	-
31	LEATHER & LEATHER PRODUCTS A/	C/	C/	C/	-
32	STONE, CLAY, & GLASS PRODUCTS A/	19,264	44,247	34,970	27,030
33	PRIMARY METAL INDUSTRIES A/	C/	73,531	C/	C/
34	FABRICATED METAL INDUSTRIES A/	2,938	23,558	28,851	1,459
35	MACHINERY, EXCEPT ELECTRICAL A/	6,274	51,324	33,689	1,150
36	ELECTRICAL MACHINERY A/	3,117	86,431	12,161	1,636
37	TRANSPORTATION EQUIPMENT A/	1,316	78,398	C/	C/
38	INSTRUMENTS & RELATED PRODUCTS A/	C/	C/	C/	-
39	MISCELLANEOUS MANUFACTURING A/	C/	3,577	4,864	C/
19	ORDNANCE & ACCESSORIES A/	C/	C/	C/	-
	ALL INDUSTRIES, TOTAL A/	149,641 D/	627,141 D/	710,627 D/	106,278 D/
	OTHER FARMS IN THE STATE E/	63,859	182,037	41,721	9,254
	SUM OF LIVESTOCK FARMS & RANCHES	42,695	31,556	23,572	13,604
	LIVESTOCK FARMS F/	9,305	18,445	10,930	6,797
	LIVESTOCK RANCHES G/	33,389	13,110	12,641	6,807

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TABLE VII-38 VALUE ADDED ($1,000) 1963, Continued

IND. CODE	INDUSTRY GROUP	WASHINGTON	OREGON	CALIFORNIA
20	FOOD & KINDRED PRODUCTS A/	360,950	234,720	2,412,559
21	TOBACCO MANUFACTURERS A/	-	-	369
22	TEXTILE MILL PRODUCTS A/	C/	18,697	79,774
23	APPAREL & RELATED PRODUCTS A/	25,679	22,465	438,872
24	LUMBER & WOOD PRODUCTS A/	360,706	700,535	510,358
25	FURNITURE & FIXTURES A/	21,045	20,769	318,617
26	PAPER & ALLIED PRODUCTS A/	330,262	116,901	371,101
27	PRINTING & PUBLISHING A/	87,051	55,789	846,820
28	CHEMICAL & ALLIED PRODUCTS A/	238,150	34,528	809,488
29	PETROLEUM & COAL PRODUCTS A/	63,956	C/	476,756
30	RUBBER & PLASTICS PRODUCTS A/	5,415	4,696	334,626
31	LEATHER & LEATHER PRODUCTS A/	1,821	2,249	39,415
32	STONE, CLAY, & GLASS PRODUCTS A/	70,413	38,537	654,022
33	PRIMARY METAL INDUSTRIES A/	202,202	C/	603,882
34	FABRICATED METAL INDUSTRIES A/	76,474	58,626	1,036,525
35	MACHINERY, EXCEPT ELECTRICAL A/	73,632	69,701	1,086,421
36	ELECTRICAL MACHINERY A/	29,673	55,381	2,192,114
37	TRANSPORTATION EQUIPMENT A/	1,058,202	50,745	2,665,830
38	INSTRUMENTS & RELATED PRODUCTS A/	C/	10,880	259,519
39	MISCELLANEOUS MANUFACTURING A/	14,896	11,488	277,554
19	ORDNANCE & ACCESSORIES A/	-	C/	1,743,355
	ALL INDUSTRIES, TOTAL A/	3,028,577 D/	1,574,816 D/	17,162,564 D/
	OTHER FARMS IN THE STATE E/	306,121	182,728	1,497,707
	SUM OF LIVESTOCK FARMS & RANCHES	32,376	40,327	151,180
	LIVESTOCK FARMS F/	22,100	24,655	74,284
	LIVESTOCK RANCHES G/	10,276	15,673	76,895

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TABLE VII-38, Continued

VALUE ADDED FOOTNOTES

A/ 1963 Census of Manufacturers, U.S. Department of Commerce, Bureau of the Census.
B/ (Not used)
C/ The Bureau of the Census did not publish the data for this industry because it would have released information about a specific firm.
D/ The all industries total does not add up to the sum of the column because it includes the value added by the manufacturers for which data was not released due to disclosure of information about an individual firm.
E/ 1964 Census of Agriculture, U.S. Department of Commerce, Bureau of the Census, to obtain value added for total farms. The data was modified to the 1963 base year by the Wholesale Index of all Farm Products published in the Statistical Abstract of the United States, U.S. Department of Commerce, 1965. "Other Farms" amounts obtained by deducting "Sum of Livestock Farms and Ranches" from "Total Farms."
F/ Ibid. Livestock farms, excluding poultry and dairy as defined in the 1964 Census of Agriculture. The value added by both commercial and other farms (part-time, part-retirement, and abnormal).
For Arizona Only - The value added by commercial farms only.
G/ 1964 Census of Agriculture, op. cit. and Statistical Abstract of the United States, op. cit.
Livestock ranches as defined in the 1964 Census of Agriculture. The value added by both commercial and other farms (part-time, part retirement, and abnormal).

To compute value added, it was necessary to subtract seven types of farm expenditures from the gross value of all products sold from the livestock operation. The farm expenditures were:

(1) Feed for livestock and poultry.
(2) Purchase of livestock and poultry.
(3) Seeds, bulbs, plants and trees.
(4) Fertilizer and fertilizing materials.
(5) Gasoline and other petroleum fuel and oil for the farm business.
(6) Machine hire, custom, and contract work.
(7) Hired labor.

The resulting figure represented the value added by the entire operation, not just the value added by the beef cattle, sheep and goats.

Since the Census of Agriculture was taken in 1964, it was necessary to convert the value added figure for the agricultural sector to 1963 so that it could be used for comparison purposes with data for the other major industries which was published in the 1963 Census of Manufacturers. The Wholesale Index of all Farm Products was used to convert the data from 1964 to 1963. The conversion factor was 1.0148.

For each type of livestock operation and all the farms in the state, value added was computed for both commercial and other farms (part-time, part-retirement, and abnormal). Arizona was the only exception. Data for livestock farms, excluding poultry and dairy, was not published for the other farms.

Other Major Industries. Data for each major industry was obtained from the 1963 Census of Manufacturers. The Census defines value added as follows:

> "Value added by manufacturers is derived by subtracting the total costs of materials (including materials, supplies, fuel, electric energy, cost of resales and miscellaneous receipts) from the value of shipments (including resales) and other receipts and adjusting the resulting amount by the net change in finished products and work-in-progress inventories between the beginning and end of the year."

Investment - Table VII-39

Comments

Agricultural Sector. Data for investments in land and buildings and livestock was computed from the 1964 Census of Agriculture.

TABLE VII-39 INVESTMENT 1963 ($ MILLIONS)

IND. CODE	INDUSTRY GROUP	MONTANA	IDAHO	WYOMING	COLORADO
20	Food & Kindred Products a/	36	83	13	189
21	Tobacco Manufacturers a/	-	-	-	-
22	Textile Mill Products a/	-	-	-	d/
23	Apparel & Related Products a/	d/	d/	d/	2
24	Lumber & Wood Products a/	65	82	6	13
25	Furniture & Fixtures a/	d/	-	d/	4
26	Paper & Allied Products a/	d/	d/	-	20
27	Printing & Publishing a/	6	9	3	40
28	Chemical & Allied Products a/	6	83	1	48
29	Petroleum & Coal Products a/	d/	d/	107	48
30	Rubber & Plastics Products a/	d/	d/	d/	d/
31	Leather & Leather Products a/	d/	d/	-	d/
32	Stone, Clay & Glass Products a/	15	10	11	75
33	Primary Metal Industries a/	80	d/	-	154
34	Fabricated Metal Products a/	2	4	1	31
35	Machinery, Except Electrical a/	1	3	1	42
36	Electrical Machinery a/	-	d/	d/	20
37	Transportation Equipment a/	d/	3	d/	d/
38	Instruments & Related Products a/	d/	d/	d/	4
39	Miscellaneous Manufacturing a/	1	1	d/	5
19	Ordnance & Accessories a/	-	d/	-	d/
	All Industries, Total a/	194 e/	301 e/	67 e/	980 e/
	Other Farms in the State f/	1,598	1,658	268	1,396
	Sum of Livestock Farms & Ranches	1,800	725	1,112	1,846
	Livestock Farms f/	708	489	332	955
	Livestock Ranches f/	1,092	236	780	891

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TABLE VII-39 INVESTMENTS 1963 ($ MILLIONS), Continued

IND. CODE	INDUSTRY GROUP	NEW MEXICO	ARIZONA	UTAH	NEVADA
20	FOOD & KINDRED PRODUCTS A/	26	59	74	9
21	TOBACCO MANUFACTURERS A/	-	-	-	-
22	TEXTILE MILL PRODUCTS A/	D/	D/	2	-
23	APPAREL & RELATED PRODUCTS A/	-	3	2	D/
24	LUMBER & WOOD PRODUCTS A/	13	23	6	4
25	FURNITURE & FIXTURES A/	1	3	2	D/
26	PAPER & ALLIED PRODUCTS A/	D/	D/	D/	D/
27	PRINTING & PUBLISHING A/	8	24	17	6
28	CHEMICAL & ALLIED PRODUCTS A/	3	18	10	24
29	PETROLEUM & COAL PRODUCTS A/	30	4	72	D/
30	RUBBER & PLASTICS PRODUCTS A/	D/	D/	D/	-
31	LEATHER & LEATHER PRODUCTS A/	D/	D/	D/	-
32	STONE, CLAY & GLASS PRODUCTS A/	23	54	43	33
33	PRIMARY METAL INDUSTRIES A/	D/	124	D/	D/
34	FABRICATED METAL PRODUCTS A/	2	15	19	1
35	MACHINERY, EXCEPT ELECTRICAL A/	4	33	22	1
36	ELECTRICAL MACHINERY A/	1	40	6	1
37	TRANSPORTATION EQUIPMENT A/	1	42	D/	D/
38	INSTRUMENTS & RELATED PRODUCTS A/	D/	D/	D/	-
39	MISCELLANEOUS MANUFACTURING A/	D/	1	2	D/
19	ORDNANCE & ACCESSORIES A/	D/	D/	D/	-
	ALL INDUSTRIES, TOTAL A/	123	515	583	87
	OTHER FARMS IN THE STATE F/	644	1,343	550	136
	SUM OF LIVESTOCK FARMS & RANCHES	1,145	934	556	378
	LIVESTOCK FARMS F/	114	177	270	191
	LIVESTOCK RANCHES F/	1,031	757	286	187

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TABLE VII-39 INVESTMENTS 1963 ($ MILLIONS), Continued

IND. CODE	INDUSTRY GROUP	WASHINGTON	OREGON	CALIFORNIA
20	FOOD & KINDRED PRODUCTS A/	271	176	1,808
21	TOBACCO MANUFACTURERS A/	-	-	-
22	TEXTILE MILL PRODUCTS A/	D/	18	75
23	APPAREL & RELATED PRODUCTS A/	6	5	95
24	LUMBER & WOOD PRODUCTS A/	333	647	471
25	FURNITURE & FIXTURES A/	9	9	134
26	PAPER & ALLIED PRODUCTS A/	498	178	560
27	PRINTING & PUBLISHING A/	46	29	447
28	CHEMICAL & ALLIED PRODUCTS A/	261	38	889
29	PETROLEUM & COAL PRODUCTS A/	183	D/	1,367
30	RUBBER & PLASTICS PRODUCTS A/	4	4	266
31	LEATHER & LEATHER PRODUCTS A/	-	1	11
32	STONE, CLAY & GLASS PRODUCTS A/	86	47	796
33	PRIMARY METAL INDUSTRIES A/	340	D/	1,015
34	FABRICATED METAL PRODUCTS A/	50	39	681
35	MACHINERY, EXCEPT ELECTRICAL A/	47	45	695
36	ELECTRICAL MACHINERY A/	14	25	1,006
37	TRANSPORTATION EQUIPMENT A/	561	27	1,413
38	INSTRUMENTS & RELATED PRODUCTS A/	D/	5	125
39	MISCELLANEOUS MANUFACTURING A/	6	5	115
19	ORDNANCE & ACCESSORIES A/	-	D/	559
	ALL INDUSTRIES, TOTAL A/	2,485	1,292	14,083
	OTHER FARMS IN THE STATE F/	2,565	1,716	14,685
	SUM OF LIVESTOCK FARMS & RANCHES	767	1,050	4,286
	LIVESTOCK FARMS F/	519	574	1,337
	LIVESTOCK RANCHES F/	248	476	2,949

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TABLE VII-39, Continued

INVESTMENT FOOTNOTES

A/ Computed by the use of a capital-output ratio which was derived from national data on investment and value added in each industry group. The capital-output ratio was then applied to state data on value added for the appropriate industry to estimate investment. National investment data was obtained from Annual Survey of Manufacturers, 1964. Book Value of Fixed Assets and Rental Payments for Buildings and Equipment, U.S. Department of Commerce, Bureau of the Census. Value added data for the nation and each state was published in the 1963 Census of Manufacturers, U.S. Department of Commerce, Bureau of the Census.

B/ (Not used)

C/ (Not used)

D/ Data withheld to avoid disclosure of information about a specific firm.

E/ Computed by assuming that for each state the ratio between the sum of the value added figures reported for the individual industries to the all industries total for value added was the same as that for investment.

F/ Investment in livestock farms, livestock ranches, and total farms in the state was computed by adding the investment in land and buildings, livestock (beef cattle and sheep), and machinery and equipment. Investment in land and buildings was calculated from data published in the 1964 Census of Agriculture and was converted from 1964 to 1963 using a conversion factor calculated from data published in Farm Real Estate Market Development, U.S.D.A., E.R.S., July, 1966. Investment in livestock was calculated from data published in the 1964 Census of Agriculture and was converted from 1964 to 1963 using a conversion factor calculated from data published in Livestock and Poultry Inventory, January 1, Number, Value, and Classes, U.S.D.A., S.R.S., C.R.B. No published data was found for investment in machinery and equipment, so a conversion factor between investment in land and buildings and investment in machinery and equipment was calculated for each state, using data from the W-79 analysis (Chapter III, Section C). Investment in "Other Farms in the State" was calculated by subtracting "Livestock Farms and Ranches" from "Other Farms in the State".

(1) Investment in land and buildings: Respondents to the Census were requested to report investment as market value; however, some may have reported the original cost on a value which may not have too closely approximated market value.

(2) Investment in ranch equipment: Due to the lack of appropriate data it was possible only to estimate the ranch equipment investment.

(3) Investment in livestock: There is a basic conceptual problem in making this estimate because it is difficult to determine whether the beginning, mid, or end of the year, or some other point in time, should be used in determining the investment in livestock.

The Census was taken in November-December of 1964. Thus, numbers of cattle and sheep on hand which were used to estimate investment represents a close to the end-of-the-year inventory. As such, it may underestimate actual investment; on the other hand, for a range operation this value should closely approximate the value of the base herd.

In addition, value as determined by the Census was determined by multiplying livestock numbers by state average price for each kind of livestock. Such a method does not account for quality differences, if any exist, from the state level to the specific type of livestock operation.

Other Major Industries. The 1963 Census of Manufacturers served as the data source. Because investment in each of the major industry groups in a state was not available, it was necessary to estimate this figure using a capital-output ratio. Using this method, investment in each industry was obtained using nationwide data. This data had a deficiency in that it represented book value, which was evaluated at original cost. Thus, no allowance was made for depreciation nor was any allowance made for appreciation of certain assets. Consequently the book value, as given, may overestimate or underestimate the actual investment. For each industry, national investment was compared to national value added to obtain a capital-output ratio. The capital-output ratio was then applied to state value added data, for the appropriate industry, to estimate investment. Thus, the assumption was made that the capital-output ratio for the nation and a state is the same. This may or may not be the case.

Procedure

Agricultural Sector. The 1964 Census of Agriculture was the major source of data. Data was compiled for two types of livestock operations as defined in the Census. These operations had sales of livestock or livestock products amounting in value to 50 percent or more of the total

value of all farm products sold during the year. The first type, livestock other than dairy and poultry, included farms that produce cattle, calves, hogs, sheep, goats, wool, and mohair except for farms in the 17 western states, Louisiana, Florida, Hawaii, and Alaska that qualified as livestock ranches. The second type, livestock ranches, were those operations in the same states whose sales of livestock, wool, and mohair represented 50 percent or more of the total value of farm products sold and if pastureland or grazing land amounted to 100 acres or more and was ten or more times the acreage of cropland harvested.

Data was also compiled for all the farms in the state. The Census also publishes data for both commercial farms and other farms (part-time, part-retirement, and abnormal). For each type of livestock operation data was compiled for both commercial and other farms. The only exception was Arizona. The Census only publishes data for commercial livestock farms, excluding poultry and dairy.

The appropriate indexes, which will be discussed later, were used to convert the data from 1964 to 1963.

(1) Investment in land and buildings: The value of land and buildings was computed by multiplying the average investment per farm by the appropriate number of farms. The resulting figure was converted to the base year 1963 by use of the appropriate conversion factor for the specific state.

(2) Investment in ranch equipment: Because the various data sources on equipment only published numbers and not value of various machines, it was necessary to estimate the investment in ranch equipment. The U.S. Department of Agriculture publishes a series on costs and returns on various types of farms, including livestock ranches in the United States. From this data it was possible to calculate the investment in equipment compared to the investment in land and buildings. This figure was then applied to the appropriate state to get an estimate of ranch equipment value. In Arizona and New Mexico ranch equipment was 4 percent of the value of land and buildings whereas in the other western states it was 13 percent.

(3) Investment in livestock: The 1964 Census of Agriculture reported the number of head of cattle and sheep on hand at the time of enumeration for each type of livestock operation. The data for cattle included (a) cows and heifers that have been calved, (b) heifer and heifer calves, and (c) steers and bulls, including calves. For sheep and lambs there was data for (a) lambs under one year old, (b) ewes one year and over, and (c) rams and wethers one year and over.

Data was not published for the value of each class of livestock on the livestock operations; however, data was published

on value of livestock in the entire state. Thus it was possible to determine per unit value for each class of livestock at the state level. The per unit value multiplied by the number of head in each livestock class for the livestock operation gave the value of the livestock. The data was converted to the 1963 base year by the use of calculated conversion factors. The conversion factor for cattle was 1.127 and the one for sheep was .932.

Other Major Industries. It was necessary to estimate the investment in each of the major industries in each state. To do this a capital-output ratio was derived from national data for each industry group. This ratio represents the dollars of investment that were required to produce one dollar value added. The assumption was then made that for a particular industry the capital-output ratio for the nation and the state was the same.

National investment in an industry was obtained from a special report of the Bureau of the Census. Value added data for the nation and each of the Eleven Western States was given in the 1963 Census of Manufacturers.

$$\text{Capital-output ratio for a given industry} = \frac{\text{Investment, 1963}}{\text{Value added, 1963}}$$

The national capital-output ratio for a given industry was then applied to state data on value added for the same industry to estimate investment. For a given industry:

$$(\text{Capital-output radio, Nation}) \quad (\text{Value added, State}) = \text{Investment, State}$$

Home Produced and Consumed Feed

Procedure

Data was compiled for two types of livestock operations as defined in the Census. These operations had sales of livestock or livestock products amounting in value to 50 percent or more of the total value of all farm products sold during the year. The first type, livestock other than dairy and poultry, included farms that produce cattle, calves, hogs, sheep, goats, wool, and mohair, except for farms in the 17 western states, Louisiana, Florida, Hawaii, and Alaska that qualified as livestock ranches. The second type, livestock ranches, were those operations in the same states whose sales of livestock, wool, and mohair represented 50 percent or more of the total value of farm products sold and if pastureland or grazing land amounted to 100 or more acres and was ten or more times the acreage of cropland harvested. As can be seen by the above definitions, the Census data does not restrict itself to range operations. Included in the data are hog operations. Suitable data was not available to exclude this portion of the economy. Fortunately, particularly for the livestock ranches, hog numbers are relatively small in comparison to total livestock so the error is not great. In addition, livestock feeding operations could not be removed.

Because of the above factors the data was compiled separately for each type of livestock operation, as well as together. (Table VII-40)

For both the livestock farms, excluding poultry and dairy, and the livestock ranches, data was compiled for both commercial and other farms (part-time, part-retirement, and abnormal). The only exception is that Arizona only has data on commercial farms for the livestock operation classified as livestock farms, excluding poultry and dairy.

In the Census, the quantity of each crop produced on the type of livestock operation was reported. The value of each crop produced was computed by assigning the appropriate per unit value to the quantity produced. The appropriate per unit value was calculated from statewide data on quantity and value of each crop produced. The per unit value as calculated represents a statewide average annual price. The sum of the value of all field crops was computed. The resulting figure was the value of all field crops produced on the livestock operation. The value of field crops consumed thus equaled the value of field crops sold. In other words, value of feed consumed by livestock was treated as the residual of production over sales.

For certain field crops, mainly grains, the value of field crops consumed by livestock may include some of the crop that was retained for seed.

The value of field crops consumed by livestock represents consumption of harvested feed only. It does not include any crop aftermath or cover crops regardless of whether they were grazed or harvested.

TABLE VII-40

HOME PRODUCED AND CONSUMED FEED BY STATE
1964
(THOUSANDS OF DOLLARS)

State	Livestock Farms a/			Livestock Ranches a/			Sum of Livestock Farms and Ranches		
	Production of Field Crops b/	Sales of Field Crops c/	Consumption of Field Crops d/	Production of Field Crops b/	Sales of Field Crops c/	Consumption of Field Crops d/	Production of Field Crops b/	Sales of Field Crops c/	Consumption of Field Crops d/
Montana	50,095	17,710	32,385	29,295	5,263	24,032	79,390	22,973	56,417
Idaho	34,055	14,252	19,803	6,551	1,342	5,209	40,606	15,594	25,012
Wyoming	22,114	7,108	15,006	13,246	1,379	11,867	35,358	8,487	26,871
Colorado	55,201	27,630	27,571	12,807	1,938	10,869	68,008	29,568	38,440
New Mexico	4,156	2,818	1,338	4,013	1,329	2,684	8,171	4,147	4,024
Arizona	e/ 11,649	e/ 8,124	e/ 3,525	1,983	776	1,207	13,632	8,900	4,732
Utah	14,843	3,817	11,026	4,232	597	3,635	57,162	4,414	52,748
Nevada	8,761	1,450	7,311	4,160	273	3,887	12,921	1,723	11,198
Washington	17,976	8,481	9,495	5,057	1,478	3,579	23,034	9,959	13,075
Oregon	23,094	7,290	15,804	12,137	1,848	10,289	35,230	9,138	26,092
California	40,453	25,770	14,683	12,117	5,844	6,273	52,570	31,614	20,956

a/ U.S. Dept. of Commerce, Bureau of the Census. Includes data for commercial and other farms (part-time, part-retirement, and abnormal).
b/ Calculated by applying the appropriate state-wide per unit crop price to the individual crops that were produced on the livestock operation and summing the resulting figure to determine overall value of the field crops produced.
c/ U.S. Dept. of Commerce, Bureau of the Census, 1964 Census of Agriculture.
d/ Value of consumption of field crops - Value of production of field crops - Value of sales of field crops. This figure represents the value of consumption of harvested field crops by all livestock on the livestock operation. It does not include crop aftermat or cover crops. It may include some seed.
e/ Commercial farms only.

As previously mentioned, due to the nature of the census data, the value of consumption includes feed consumed by all classes of livestock on these operations, not just beef cattle, sheep, and goats. In terms of relative numbers, hogs, dairy cattle and poultry are small relative to the number of beef cattle, sheep, and goats. Of the two types of livestock operations, the error involved is greatest for livestock farms, excluding poultry and dairy. The error is also greater for feed grains than it is for the other feeds.

Western State Livestock Products Consumption vs. Production

To determine total consumption of any animal product within a given state for a specific year it is necessary to know the population and per capita consumption. Thus population multiplied by per capita consumption equals total consumption.

The 1955 Household Food Consumption Survey conducted by the U.S. Department of Agriculture in the spring of 1955 gathered data on consumption of various foods in four regions of the United States: Northeast, North Central, South and West. The Survey also gathered data for different types of urbanizations, namely: urban, rural nonfarm, and rural farm. The results from the Survey indicated that there were different patterns of per capita consumption of foods in each of the four regions and urbanization.

Thus, data published in the 1955 Household Food Consumption Survey was used to modify the U.S. Department of Agriculture time series data on per capita consumption of beef and lamb and mutton.

The total population in each of the Eleven Western States was subdivided into the three urbanization categories: urban, rural nonfarm, and farm. Thus it was possible to account more accuragely for per capita consumption differences between states that have a different population make-up.

With the exception of the census year, 1960, the Bureau of Census does not subdivide population in its Current Population Reports into the three types of urbanizations. Thus, it was necessary for each state to estimate the number of people in each type of urbanization for the years 1962-1966. The formulae that were used to estimate the number of persons in each urbanization for a given year are as follows:

1) Rural Farm population, state =
$$\frac{\text{1960 state rural farm population}}{\text{1960 U.S. rural farm population}} \left(\quad\right) \text{U.S. rural farm population} \left(\quad\right) (100)$$
then

2) Nonfarm population, state = Total Population, ( ) state - Rural Farm population, state

3) Percent urban is of nonfarm population, 1960 =
$$100 \frac{\text{(1960 urban population, state)}}{\text{(1960 nonfarm population, state)}} \left(\quad\right)$$

4) Urban population = (percent urban is of nonfarm pop., 1960) (nonfarm pop., state)

5) Rural nonfarm population, state = nonfarm population, state - urban population, state

The results were as expected. Because total U. S. farm population was declining, the farm population in each state also decreased during the period 1962-1966. Total population in most of the states increased during this period. Urban population and rural nonfarm population also increased.

Beef and Veal Consumption were estimated by two slightly different procedures so their estimation will be discussed separately.

Beef Consumption in each of the Eleven Western States was based upon the U.S. Department of Agriculture time series per capita consumption data, modified by the 1955 Household Food Consumption Survey to reflect the higher per capita beef consumption in the West and the differences between states due to urbanization make-up.

The method that was used was a procedure that was suggested in a U.S. Department of Agriculture agricultural handbook. Using this procedure for each urbanization data was abstracted from the 1955 Household Food Consumption Survey on pounds of beef that were consumed in a week from all sources by the number of people in the family. This figure was multiplied by 52 to obtain annual consumption for the family. The family annual consumption was divided by the number of persons in the family to determine per capita consumption. The per capita consumption figure from the Survey was then compared to the 1955 U.S. Department of Agriculture estimate of per capita consumption for the entire United States. From this comparison a conversion factor was obtained for each urbanization category which could be applied to the U.S. Department of Agriculture time series estimates for 1962-1966.

The same procedure was used for each of the other three regions: the Northeast, the North Central, and the South.

The modified estimates of per capita consumption in each region further were adjusted for the differences in eating habits in each urbanization category to determine total consumption of beef in the United States. Total U. S. consumption was then balanced against total U. S. supply. The total supply was the sum of production, imports and inshipments and beginning stocks minus exports and shipments. Total supply was converted from a carcass weight basis to a retail equivalent basis by use of the factor .74. The resulting balance indicated that it was necessary to proportionately reduce the per capita consumption estimates by 5 per cent so that total U. S. consumption did not exceed total U. S. supply.

The formula used to determine beef consumption for a state in a given year was: Total Beef Consumption = (Urban population) (Urban per capita consumption) + (Rural non-farm population) (Rural non-farm) + (Rural farm population) (Rural farm per capita consumption).

Veal Consumption was not modified either for difference between the West and the entire United States nor for urbanization. This creates a slight error. However, veal consumption is a very small part of total beef and veal consumption.

The total consumption of beef and veal was added for each state to determine the total consumption of both these animal products for each year 1962-1966.

Since consumption of beef and veal was calculated on a retail equivalent basis it was necessary to compute production on the same basis. Data on total live weight production was obtained from a Statistical Reporting Service publication. This data gave "the live weight produced on farms and ranches in that State during the calendar year. It was obtained for each state by deducting the weight of livestock shipped into the State from the total pounds of marketing and farm slaughter and adding or subtracting, as the case might be, the difference in the inventory poundage between the beginning and the end of the year. The sum of production for the states gives the total production for the United States." (Table VII-41)

Total live weight production was converted to a retail equivalent basis after first converting it to a carcass yield basis. The formula was:

Carcass yield = (Total live weight) (.533) ( )
Retail equivalent - (Carcass yield) (.74) ( )

The total live weight production was used as the figure representing total production in the state instead of data on commercial slaughter because the latter data included animals that were shipped into a state for immediate slaughter even though they were raised in another state. Thus total live weight production in a state more closely reflects actual production.

Balance between Production and Consumption for each state and the West for every year in the 1962-1966 period, production was balanced against consumption to determine whether the area was a surplus or deficit producer of beef and veal.

Lamb and Mutton: The U.S. Department of Agriculture time series per capita consumption data for lamb and mutton was modified by the 1955 Household Food Consumption Survey to account for differences between the West and the rest of the United States and also differences in the urbanization make-up of states in the West. The procedure that was used was the same as that described for beef.

After the estimated per capita consumption figures were computed by urbanization for each region (Northeast, North Central, South and West) they were used, along with urbanization population estimates,

TABLE VII-41

RELATIONSHIP BETWEEN PRODUCTION AND CONSUMPTION OF BEEF AND VEAL IN THE 11 WESTERN STATES (1,000 LB. RETAIL EQUIV.) 1962-1966

Year	Production Retail Equivalent a/	Consumption Retail Equivalent b/	Surplus or Deficit(-) of Production over Consumption Retail Equivalent
Montana			
1962	259,107	42,954	216,153
1963	298,288	45,212	253,076
1964	290,845	46,189	244,656
1965	278,455	47,027	231,428
1966	313,455	47,886	265,569
Idaho			
1962	114,042	42,861	71,181
1963	134,302	43,617	90,685
1964	134,302	44,440	89,862
1965	132,979	45,040	87,939
1966		45,864	
Wyoming			
1962	164,819	29,460	135,359
1963	164,819	31,243	133,576
1964	157,307	31,935	125,372
1965	157,931	32,634	125,297
1966		32,994	
Colorado			
1962	377,832	192,332	185,500
1963	414,844	192,875	221,969
1964	431,047	185,475	245,572
1965	454,560	195,450	259,110
1966	495,798	195,561	300,237
New Mexico			
1962	156,957	76,201	80,756
1963	177,243	77,196	99,047
1964	155,261	77,365	77,896
1965	154,033	78,339	75,694
1966	171,037	100,111	70,926
Arizona			
1962	173,504	127,182	832
1963	187,397	127,279	(7,490)
1964	125,212	127,313	(2,101)
1965	133,323	130,230	(6,907)
1966	155,976	136,872	
Oregon			
1962	170,210	161,369	8,841
1963	178,860	171,603	7,257
1964	195,282	184,845	10,437
1965	196,962	196,962	1,888
1966	200,231	200,218	1,143
California			
1962	399,419	1,439,149	(039,570)
1963	414,848	1,454,099	(1,039,551)
1964	432,337	1,452,007	(1,019,670)
1965	384,343	1,474,959	(1,020,633)
1966	390,900	1,381,379	(1,114,479)
The West			
1962	2,343,150	2,504,223	(161,063)
1963	2,562,757	2,687,554	(124,416)
1964	2,622,423	2,760,123	(137,700)
1965	2,695,366	2,832,466	(137,100)
1966	2,818,228	2,851,166	(32,940)
Montana			
1962	85,682	51,842	33,840
1963	86,802	51,835	35,967
1964	92,435	53,202	39,233
1965	92,435	53,174	39,261
1966	93,760	54,318	39,442
Idaho			
1962	54,221	30,382	23,839
1963	54,221	30,734	23,490
1964	62,977	31,335	31,642
1965	62,249	31,335	30,914
1966	63,442	43,134	20,408
Nevada			
1962	140,041	250,591	(110,550)
1963	140,041	271,571	(131,530)
1964	134,149	284,177	(150,028)
1965	134,177	287,451	(153,274)
1966	139,533	285,354	(145,821)
Washington			
1962	80,504	127,107	832
1963	81,167	127,279	(7,490)
1964	81,496	127,313	(2,101)
1965	83,645	130,230	(6,907)
1966	71,926	136,872	
Arizona			
1962	173,504	127,182	832
1963	187,397	127,279	(7,490)
1964	125,212	127,313	(2,101)
1965	133,323	130,230	(6,907)
1966	155,976	136,872	
California			
1962	399,419	1,439,149	(039,570)
1963	414,848	1,454,099	(1,039,551)
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The West			
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1965	2,695,366	2,832,466	(137,100)
1966	2,818,228	2,851,166	(32,940)

a/ Production retail equivalent - (carcass yield) (.74) where carcass yield = (total live weight) (.533). Data on total live weight production was published in Statistical Reporting Service publication, "Livestock Production, Disposition and Income by States, 1966" (Table 29). Data on Total Slaughter, Farm Production, Disposition and Income by States, 1966 (Table 29). Data on Total Slaughter, Farm Production, Disposition and Income by States, 1966 (Table 29). Data on Total Slaughter, Farm Production, Disposition and Marketing Administrative Reports, April 1966. The conversion factor, .533, was published in Livestock Slaughter, Agricultural Marketing Service, Statistical Bulletin No. 364, June 1963. The conversion factor, .74, was published in USDA and Bureau for Agricultural Economics and Their Consumption retail equivalent - beef consumption + veal consumption. Data on beef consumption was modified for the type of urbanization in the West. Veal consumption was not modified for the type of urbanization in the West. The total consumption data was obtained from the Food Consumption Survey, 1955, Reports 1 and 3, 1956. The rest of the United States - (California and Pacific Northwest) and the differences beef consumption was modified for the type of urbanization in the West. Veal consumption was not modified for urbanization nor for regional differences.

to determine total U. S. lamb and mutton consumption. Total U. S. lamb and mutton consumption, as estimated, was balanced against total U. S. lamb and mutton supply. Total supply of lamb and mutton was equal to the sum of production, imports and inshipments, and beginning stocks minus exports and shipments. Total supply was converted from a carcass weight basis to a retail equivalent basis by use of the factor .89. Consumption as estimated was balanced against supply for the sppropriate year. It was necessary to reduce the estimated per capita consumption data by 10.4 percent so that U. S. consumption did not exceed U. S. supply.

Total live weight production (Table VII-42) was converted to retail equivalent basis by the following formula:

Carcass Yield - (Total Live Weight) (.465) ( )
Retail Weight Equivalent - (Carcass Yield) (.89) ( )

Balance between Production and Consumption: Production and consumption were balanced each year to determine whether each State and the West was a surplus or deficit lamb and mutton producer.

Wool: For each state and the West, total population was multiplied by scoured wool per capita consumption to determine total wool consumption in each year of the 1962-1966 period.

Production of wool was published in a shorn grease wool basis. This data was converted to a scoured wool basis by the use of the appropriate conversion factor (1962 & 1963 was .45 and 1964-1966 was .477). (Table VII-43) The information was compiled for each year, 1962-1966, for each state in the West.

Balance between Production and Consumption: Production and consumption were balanced against one another to determine, for each year in the 1962-1966 period, whether the state in question and the West was a surplus or deficit wool producer.

TABLE VII-42

MEASUREMENTS ESTIMATED PRODUCTION AND CONSUMPTION OF LAMB AND MUTTON IN THE 11 WESTERN STATES AND THE WEST (1,000 POUNDS) 1962-1966

Year	Production Retail Equivalent a/	Consumption Retail Equivalent b/	Surplus (Deficit) of Production over Consumption Retail Equivalent
Montana			
1962	31,346	4,205	27,139
1963	30,842	4,577	25,265
1964	30,842	4,577	25,265
1965	29,988	4,560	25,428
1966	27,906	3,553	24,353
Idaho			
1962	35,061	4,126	30,935
1963	34,471	4,085	30,386
1964	35,110	3,663	31,447
1965	29,111	3,664	25,447
1966	29,280	3,329	25,951
Wyoming			
1962	40,948	2,127	38,821
1963	41,755	2,246	39,509
1964	42,553	2,125	40,428
1965	43,531	1,920	41,611
1966	38,534	1,913	36,621
Colorado			
1962	44,457	13,816	30,641
1963	41,392	13,452	27,940
1964	37,763	12,423	25,340
1965	37,414	10,282	27,132
1966	34,731	11,321	23,410
New Mexico			
1962	17,022	6,439	10,583
1963	17,021	6,519	10,502
1964	13,443	5,501	7,942
1965	13,443	5,501	7,942
1966	13,377	5,342	8,035
Arizona			
1962	7,848	10,319	(2,471)
1963	9,054	10,534	(1,480)
1964	9,054	9,241	813
1965	8,502	9,261	239
1966	8,394	9,244	(850)
Utah			
1962	25,356	7,082	18,274
1963	25,020	7,503	17,517
1964	21,570	5,8[illegible]	15,737
1965	21,843	[illegible]	15,947
1966	21,843	[illegible]	[illegible]
Nevada			
1962	7,030	3,633	3,397
1963	5,534	3,532	2,002
1964	5,534	3,532	2,002
1965	5,356	3,238	2,118
1966	5,355	2,154	2,835
Washington			
1962	7,296	7,347	(51,73)
1963	6,301	7,519	(1,218)
1964	5,063	6,613	(1,550)
1965	5,063	6,597	(1,534)
1966	5,193	6,597	(1,404)
Oregon			
1962	19,074	7,978	11,096
1963	18,436	8,372	10,064
1964	15,910	5,847	10,063
1965	15,551	6,233	9,318
1966	15,155	4,657	10,498
California			
1962	47,042	11,902	35,140
1963	46,064	11,662	34,402
1964	43,021	11,364	31,657
1965	43,021	11,364	31,657
1966	37,635	11,328	26,307
The West			
1962	276,788	57,267	219,521
1963	269,444	57,143	212,301
1964	242,444	54,107	188,337
1965	236,375	54,035	182,340
1966	224,293	51,553	172,740

Year	Production Retail Equivalent a/	Consumption Retail Equivalent b/	Surplus (Deficit) of Production over Consumption Retail Equivalent
Montana			
1962	31,346	4,205	27,139
1963	30,842	4,577	25,265
1964	30,842	4,577	25,265
1965	29,988	4,560	25,428
1966	27,906	3,553	24,353
Idaho			
1962	35,061	4,126	30,935
1963	34,471	4,085	30,386
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1964	9,054	9,241	813
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1966	8,394	9,244	(850)
Utah			
1962	25,356	7,082	18,274
1963	25,020	7,503	17,517
1964	21,570	5,8[illegible]	15,737
1965	21,843	[illegible]	15,947
1966	21,843	[illegible]	[illegible]
Nevada			
1962	7,030	3,633	3,397
1963	5,534	3,532	2,002
1964	5,534	3,532	2,002
1965	5,356	3,238	2,118
1966	5,355	2,154	2,835
Washington			
1962	7,296	7,347	(51,73)
1963	6,301	7,519	(1,218)
1964	5,063	6,613	(1,550)
1965	5,063	6,597	(1,534)
1966	5,193	6,597	(1,404)
Oregon			
1962	19,074	7,978	11,096
1963	18,436	8,372	10,064
1964	15,910	5,847	10,063
1965	15,551	6,233	9,318
1966	15,155	4,657	10,498
California			
1962	47,042	11,902	35,140
1963	46,064	11,662	34,402
1964	43,021	11,364	31,657
1965	43,021	11,364	31,657
1966	37,635	11,328	26,307
The West			
1962	276,788	57,267	219,521
1963	269,444	57,143	212,301
1964	242,444	54,107	188,337
1965	236,375	54,035	182,340
1966	224,293	51,553	172,740

a/ Production retail equivalent = (Carcass yield) (.89) where carcass yield = (Total live weight) (.465). Data on total live weight production for 1962-1966 were published in Sheep and Lamb Slaughter, 1965-66, Statistical Bulletin No. 397, Sept. 1967, and CSS, Meat Animals, Farm Production, Disposition, and Income, by States, April 1966 and April 1967. The conversion factor (.465) was figured from data in Meat Animals and Their Products, Statistical Bulletin No. 34, June 1948. The conversion factor, .89, was published in USDA, ERS, U.S. Food Consumption, Statistical Bulletin No. 334, June 1964.

b/ Consumption was modified for the type of urbanization (urban, rural nonfarm, and rural farm) and the difference in lamb consumption in the West, and the rest of the United States as indicated by the Nationwide Food Consumption Survey, 1965-66, Household Food Consumption, Spring 1966. The method that was used was published in USDA, West Consumption Trends and Patterns, Agricultural Handbook 187, 1962.

TABLE VII-43

RELATIONSHIP BETWEEN PRODUCTION AND CONSUMPTION OF WOOL IN THE 11 WESTERN STATES AND THE WEST
(1,000 POUNDS)
1962-1966

Year	Production Scoured Basis a/	Consumption Scoured Basis b/	Surplus or (Deficit) of Production over Consumption Scoured Basis
Montana			
1962	6,556	2,123	4,433
1963	6,414	2,068	4,346
1964	6,413	1,800	4,613
1965	5,964	1,902	4,062
1966	5,625	1,783	3,842
Idaho			
1962	4,476	2,120	2,356
1963	4,232	2,033	2,199
1964	4,018	1,759	2,259
1965	3,747	1,881	1,866
1966	3,727	1,770	1,957
Wyoming			
1962	9,475	1,013	8,462
1963	9,691	988	8,703
1964	9,308	865	8,443
1965	9,037	897	8,140
1966	9,206	810	8,396
Colorado			
1962	6,659	5,743	916
1963	6,752	5,643	1,109
1964	6,054	4,969	1,085
1965	5,247	5,276	(29)
1966	5,695	4,966	729
New Mexico			
1962	4,751	2,983	1,768
1963	4,571	2,920	1,651
1964	4,549	2,580	1,969
1965	4,135	2,745	1,390
1966	4,156	2,545	1,611
Arizona			
1962	1,523	4,471	(2,948)
1963	1,625	4,475	(2,850)
1964	1,778	3,965	(2,187)
1965	1,940	4,268	(2,328)
1966	1,730	4,072	(2,342)
Utah			
1962	5,051	2,922	2,129
1963	5,017	2,870	2,147
1964	5,219	2,501	2,718
1965	4,577	2,683	1,894
1966	4,720	2,558	2,162
Nevada			
1962	1,211	1,058	153
1963	1,113	1,153	(40)
1964	1,168	1,070	98
1965	990	1,173	(183)
1966	1,069	1,095	(26)
Washington			
1962	1,208	8,979	(7,771)
1963	1,066	8,735	(7,669)
1964	1,017	7,606	(6,589)
1965	903	8,065	(7,162)
1966	747	7,722	(6,975)
Oregon			
1962	2,967	5,342	(2,375)
1963	2,952	5,463	(2,511)
1964	2,823	4,828	(2,005)
1965	2,410	5,249	(2,839)
1966	2,340	5,011	(2,671)
California			
1962	7,764	[illegible]	(44,085)
1963	7,063	[illegible]	(44,727)
1964	7,433	46,066	(38,633)
1965	7,031	49,864	(42,833)
1966	6,498	47,757	(41,259)
The West			
1962	51,641	88,773	(37,132)
1963	50,496	88,138	(37,642)
1964	49,800	78,031	(28,231)
1965	45,961	84,003	(38,042)
1966	45,513	80,089	(34,576)

a/ Scoured wool production = (sheep wool grease basis) (conversion factor). The conversion factor was .45 in 1962 and 1963 and .477 for the 1964-1966 period. The conversion factor was obtained from USDA, FRS, SRS, AR, FAS, 1967 Handbook of Agricultural Charts, No. 348. The data on production of shorn wool grease basis was published in USDA, ERS Wool Statistics and Related Data, 1920-64, Supplement for 1966 to Statistical Bulletin 363, July 1967.
b/ Consumption = (total population) (per capita consumption). The data for population was obtained from U. S. Dept. of Commerce, Bureau of the Census, Estimates of the Population of States, Population Estimates, Current Population Reports, July 1, 1966. Total population included armed forces personnel stationed in the United States. Per capita consumption data was published in USDA, ERS, Wool Statistics and Related Data, 1920-64, Supplement for 1966 to Statistical Bulletin No. 363, July 1967.

Movements of Cattle and Sheep

Objective

The objective was divided into two parts, cattle and sheep. Since the project is a study of the contribution of the forage resource in the Eleven Western States, the initial products, stocker-feeder cattle and lambs, were the classes of livestock chosen for study.

The original objective requested estimates of the number of head shipped into and shipped out of each of the Eleven Western States. The main data sources for such estimates are various USDA publications. The USDA publishes inshipments to each of the states but outmovements are lumped together with total marketing. Thus, using the estimation procedure that will be described later, it was only possible to determine whether a state was a net surplus or a net deficit area.

To accomplish the original objective would have required a study beyond the resources allocated to this portion of the study.

Such estimates have been made for 1962 by the Western Livestock Marketing Research Technical Committee in their publication. It was impossible with the resources available to duplicate the procedure used in this bulletin so that a trend for the 1962-1966 period.

Procedure

Net Movement of Stocker-Feeder Cattle.

The net movement of stocker-feeder cattle in each of the Eleven Western States and in the West was estimated for the years 1962, 1964 and 1966 from data published in various reports of the U.S. Department of Agriculture. The procedure that was used was a modification of one developed by a private company (non-disclosure has been requested). The analysis has been developed on a flow chart (Figure VII-13).

It was assumed that a one-year lag existed between the time a calf was born until it could become a stocker or feeder animal. For example, a calf born in 1961 became available to the stocker-feeder supply in 1962. In addition, the assumption was made that a calf born in 1961 would have been marketed as a fed animal in 1962. In reality, this assumption was not entirely correct; however, it was felt that the carry-over of animals from one year to another would be offsetting.

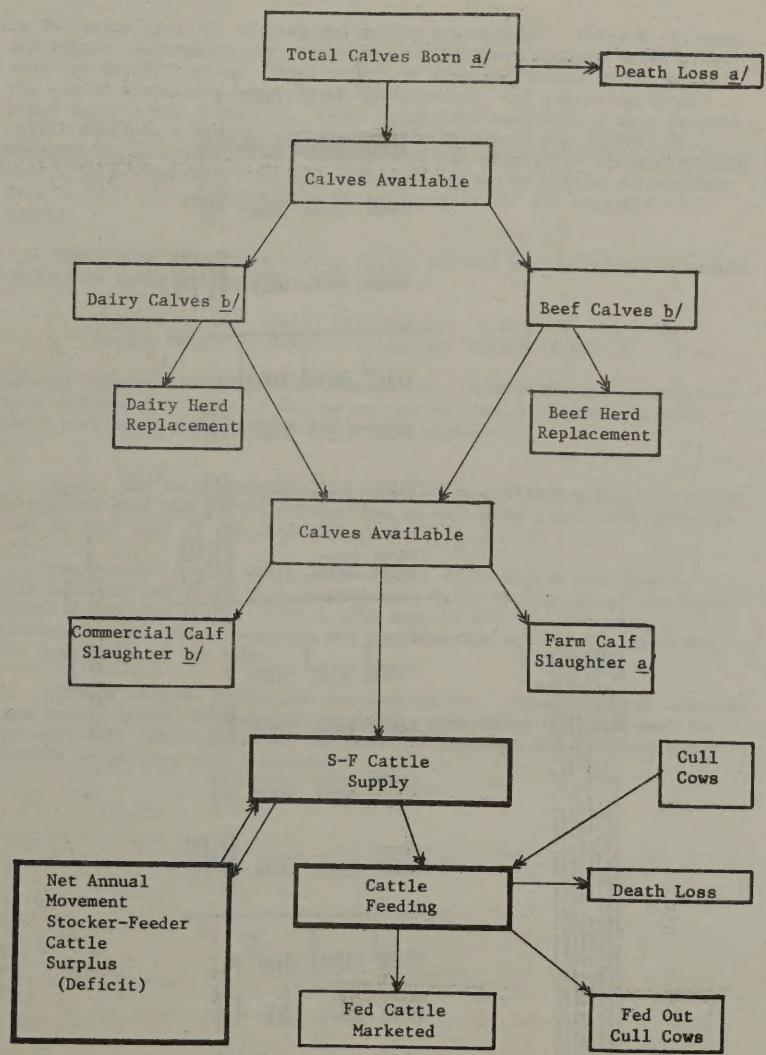

Figure III B-20 and VII-13. Calf and Stocker-Feeder Cattle Movement Flow Diagram.

Footnotes
for
Net Movement of Stocker-Feeder Cattle

Figure III B-20 and VII-13

a/ USDA, SRS, CRB, Meat Animals, Farm Production, Disposition, and Income, by States, 1960-64, Revised Estimates, Statistical Bulletin 400, May 1967, and USDA, SRS, CRB, Meat Animals, Farm Production Disposition, and Income, by States, April 1966 and April 1968.

b/ USDA, Agricultural Statistics.

c/ USDA, ERS, Livestock & Meat Situation, May 1967.

d/ The estimate of the proportion of the fed cattle marketed that were cows was calculated from data published in USDA, SRS, CRB, Cattle and Calves and Sheep and Lambs on Feed, Selected States, 1959-65, Revised Estimates, Statistical Bulletin No. 387, Jan., 1967, and USDA, SRS, CRB, Cattle on Feed, Cattle Sold for Slaughter ... Selected Markets, Jan. 1967.

The published data did not report the proportion of the total calves born that were beef and dairy. Thus, the assumption was made that the percentage of the two types of calves was directly proportional to the beef cows and dairy cows on farms that were two years and older. In other words, the assumption was that the percentage calf crop was the same for the two types of cows. This assumption was not entirely true; however, the error will not be great.

Beef herd replacement was set at 20 percent. Data published by the USDA indicated a culling rate of 12-13 percent. After making an allowance for death loss between entry into the basic herd and culling, it was assumed that a replacement rate of 20 percent would have been needed.

The stocker-feeder supply in a given year was a residual after allowing for death loss, dairy and beef herd replacement, and commercial and farm slaughter of calves.

The number of head of fed cattle marketed in the subsequent year was obtained and adjusted for death loss to determine how many head were placed on feed. This figure included some cull cows that were in feed lots, so the number of cull cows fed out were removed from the fed-cattle marketings. This figure was balanced against the stocker-feeder supply to ascertain whether the particular state in question or the West was a surplus or deficit producer of stocker-feeder cattle.

This estimating procedure has accounted for most of the factors that influence the net movement of stocker-feeder cattle of a state or the West except for grass-fat long-yearlings that move directly to slaughter. In recent years their numbers have been declining so this should not create a significant error.

Net Movement of Lambs.

The net movement of lambs was estimated for the years 1962, 1964 and 1966 for each of the Eleven Western States and the West. The analysis has been developed on a flow chart (Figure VII-14).

The production cycle is shorter for sheep than it is for cattle. A lamb born in a given year was considered to be slaughtered within the same year. In reality, some of the lambs born in a given year are not marketed until the subsequent year. It was assumed that the overlap would be offsetting so the error involved would be canceled.

The lambs saved are the lambs that have been docked or branded before July 1.

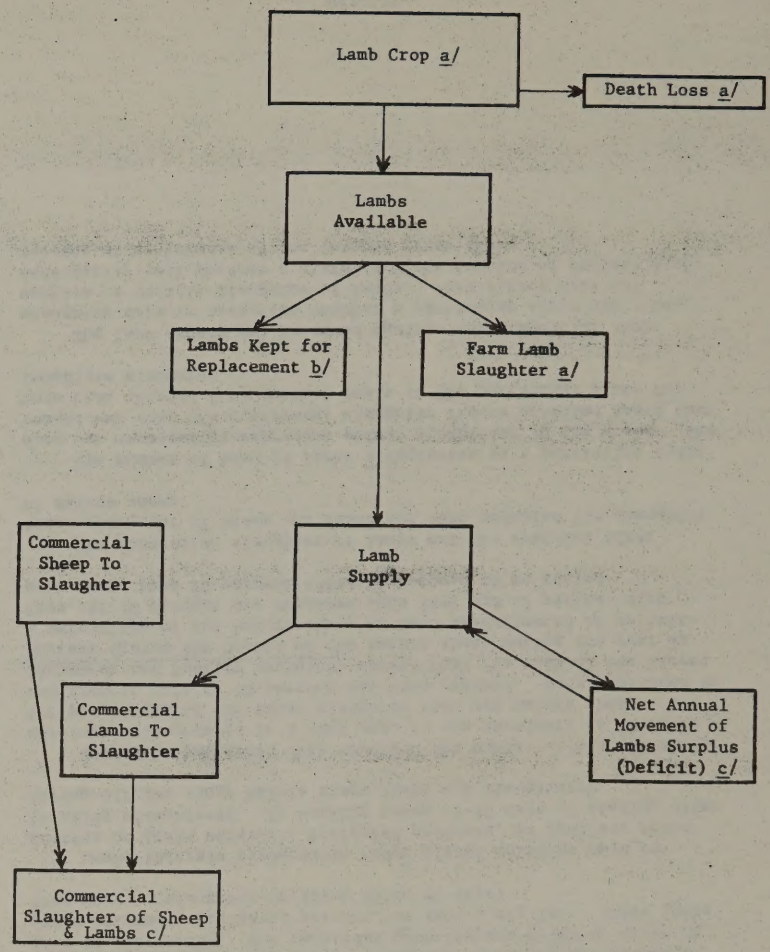

Figure III B-21 and VII-14. Lamb Movement Flow Diagram.

Footnotes
for
Net Movement of Lambs

Figure III B-21 and VII-14

a/ USDA, SRS, CRB, Meat Animals, Farm Production, Disposition, and Income, by States 1960-64, Revised Estimates, Statistical Bulletin 400, May 1967.

USDA, SRS, CRB, Meat Animals, Farm Production, Disposition, and Income, by States, April 1966 and April 1968. For 1966 because the statistics available lumped farm and sheep lamb slaughter, it was necessary to estimate the farm slaughter of lambs on the basis of the five-year average, 1961-65, of farm lamb slaughter to total farm slaughter.

b/ The replacement rate was assumed to equal 30 percent.

c/ USDA, Agricultural Statistics. The commercial slaughter of sheep and lambs represents slaughter in federally inspected plants and all other commercial slaughter but it excludes farm slaughter.

d/ The commercial slaughter of sheep was assumed to equal 20 percent of all commercial slaughter. A replacement rate of 30 percent had been assumed. Data published in USDA, SRS, CRB, Livestock and Poultry Inventory, January 1, Number, Value and Classes, showed that for each of the eleven western states the deaths of mature sheep during the year as a percentage of the mature sheep on hand approximated 10 percent. Thus, if 30 percent are replaced each year and 10 percent died each year, then 20 percent could be assumed to be culled.

e/ This figure represents the net position of each state when the lambs, other than replacements, have gone through the entire production process up to the final one of slaughter. This figure does not necessarily represent the number of lambs fed within the state and slaughtered in the state. Except for California and Colorado, data are not published which tell how many lambs are fed in a particular state. Data for commercial slaughter include slaughter of animals fed-out and slaughtered in the state as well as animals that were fed-out in one state and shipped to another state for immediate slaughter. Thus, the net position portrayed for a state may be an overestimation or an underestimation of its actual production.

The assumption was made that a lamb born in a given year, except for those that are replacements would be slaughtered within 12 months. In reality, some lambs born in the spring of one year would not have been slaughtered until the spring of the following year; however, it was assumed that spring slaughter of successive years would balance one another out.

Lamb replacement rate was assumed to equal 30 percent.

The lamb supply was the residual resulting after deaths, herd replacement, and farm slaughter of lambs has been accounted for.

Lambs are produced in two basic types of operations - farm flocks and range flocks. A small percentage of the lambs that are raised in farm flocks move directly to slaughter when they are weaned at five to six months. The remainder normally are moved to graze on grain aftermat, irrigated pasture, or into a dry lot. These lambs then move to slaughter in about 30 to 90 days.

Lambs that are produced in range flocks normally move to grazing on grain aftermat, irrigated pastures, or feedlots prior to being slaughtered. It usually takes 60-90 days of feeding after moving off the range before these lambs are slaughtered.

Since the published data reported the number of head of sheep and lambs slaughtered as a lump sum, it was necessary to estimate the percentage of the total slaughter that was mature sheep. A replacement rate of 30 percent has been assumed. Data published in Livestock and Poultry Inventory showed that for each of the Eleven Western States the deaths of the mature sheep during the year as a percentage of the mature sheep on hand approximated 10 percent. Thus, if 30 percent are replaced each year and 10 percent died each year, then 20 percent could be assumed to be culled.

The commercial slaughter of lambs was the residual after total slaughter of sheep and lambs had been adjusted for slaughter of mature sheep.

The number of head of lambs slaughtered in a particular state does not necessarily represent actual production in the state. The reason was that the commercial slaughter figure included lambs that have been shipped from another state to the particular state for immediate slaughter.

The lamb supply was balanced against the commercial lamb slaughter data to ascertain whether a particular state has a net surplus or deficit slaughter of lambs. This figure does not necessarily tell whether a state is a net surplus or deficit lamb feeding state because of the reasons given above.

Table VII-44

TOTAL CAPITAL AND MAINTENANCE EXPENDITURES FOR RANGE IMPROVEMENT ON PUBLIC LANDS - USFS, BLM, BR, BSFS
1957, 1961, 1966
($1,000)

	Total - Four Agencies											
	Capital				Maintenance				Total			
	Federal	Private	Total	% Private	Federal	Private	Total	% Private	Federal	Private	Total	% Private
1957												
11 Western States	2,937.7	636.6	3,574.2	17.8	449.5	274.3	723.9	37.9	3,387.2	910.9	4,298.1	21.2
Other States	123.1	83.6	212.9	39.3	57.8	50.1	108.0	46.4	180.9	139.9	320.8	43.6
United States	3,060.8	726.3	3,787.1	19.2	507.3	324.4	831.8	39.0	3,568.2	1,050.8	4,618.9	22.7
1961												
11 Western States	5,183.6	2,373.1	7,556.7	31.4	884.1	702.2	1,586.3	44.3	6,067.7	3,075.4	9,143.0	33.6
Other States	160.0	193.8	353.8	54.8	108.9	77.9	186.8	41.7	268.9	271.8	540.6	50.3
United States	5,343.5	2,567.0	7,910.5	32.4	993.0	780.2	1,773.2	44.0	6,336.5	3,347.1	9,683.6	34.6
1966												
11 Western States	9,377.9	1,173.3	10,551.2	11.1	774.3	662.8	1,437.0	46.1	10,152.2	1,836.0	11,988.2	15.3
Other States	506.4	137.1	643.5	21.3	120.9	147.7	268.6	55.0	627.2	284.8	912.1	31.2
United States	9,884.3	1,310.4	11,194.7	11.7	895.1	810.5	1,705.6	47.5	10,779.4	2,120.9	12,900.3	16.4

CAPITAL AND MAINTENANCE EXPENDITURES
FOR RANGE IMPROVEMENT ON PUBLIC LANDS
(1,000 Dollars)
1957, 1961, 1966

	U. S. Forest Service												Bureau of Land Management											
	Capital				Maintenance				Total				Capital				Maintenance				Total			
	Federal	Private	Total	% Private	Federal	Private	Total	% Private	Federal	Private	Total	% Private	Federal	Private	Total	% Private	Federal	Private	Total	% Private	Federal	Private	Total	% Private
1957																								
11 Western States	1,057.0	234.3	1,291.2	18.1	362.6	214.6	577.2	37.2	1,419.6	449.0	1,868.5	24.0	1,840.0	401.0	2,241.0	17.9	59.0	58.0	117.0	49.0	1,899.0	459.0	2,358.0	19.5
Other States	88.6	82.4	171.0	48.2	25.2	33.7	58.9	57.2	113.8	116.0	229.9	50.5	.0	.0	.0		.0	.0	.0		.0	.0	.0	
United States	1,145.6	316.6	1,462.2	21.6	387.8	248.4	636.2	39.0	1,533.4	565.0	2,098.4	26.9	1,840.0	401.0	2,241.0	17.9	59.0	58.0	117.0	49.0	1,899.0	459.0	2,358.0	19.5
1961																								
11 Western States	1,959.3	551.4	2,510.8	22.0	495.7	279.4	755.1	36.0	2,455.1	830.8	3,285.9	25.3	3,159.0	1,820.0	4,979.0	36.6	333.0	411.0	744.0	55.2	3,492.0	2,231.0	5,723.0	39.0
Other States	108.3	166.9	275.2	60.7	43.3	61.8	105.1	58.8	151.6	228.7	380.3	60.1	.0	20.0	20.0	100.0	.0	.0	.0		.0	20.0	20.0	100.0
United States	2,067.6	718.4	2,786.0	25.8	539.0	341.2	880.2	38.8	2,606.6	1,059.6	3,666.2	28.9	3,159.0	1,840.0	4,999.0	36.8	333.0	411.0	744.0	55.2	3,492.0	2,251.0	5,743.0	39.2
1966																								
11 Western States	2,972.2	557.0	3,529.2	15.8	536.6	381.2	917.8	41.5	3,508.8	938.2	4,447.1	21.1	6,128.0	577.0	6,705.0	8.6	143.0	271.0	414.0	65.4	6,271.0	848.0	7,119.0	11.9
Other States	315.8	119.3	435.1	27.4	44.3	120.8	165.0	73.2	360.1	240.0	600.2	40.0	.0	.0	.0		.0	.0	.0		.0	.0		
United States	3,288.0	676.2	3,964.3	17.0	580.9	502.0	1,082.9	46.4	3,869.0	1,178.3	5,047.3	23.3	6,128.0	577.0	6,705.0	8.6	143.0	271.0	414.0	65.4	6,271.0	848.0	7,119.0	11.9

	Bureau of Sport Fisheries and Wildlife												Bureau of Reclamation											
	Capital				Maintenance				Total				Capital				Maintenance				Total			
	Federal	Private	Total	% Private	Federal	Private	Total	% Private	Federal	Private	Total	% Private	Federal	Private	Total	% pri-vate	Federal	Private	Total	% Private	Federal	Private	Total	% Private
1957																								
11 Western States	40.7	1.3	41.9	3.0	27.9	1.7	29.6	5.6	68.6	2.9	71.6	4.1												
Other States	34.5	7.4	41.9	17.6	32.6	16.4	49.0	33.5	67.1	23.8	90.9	26.2												
United States	75.2	8.7	83.9	10.3	60.5	18.1	78.6	23.0	135.8	26.8	162.5	16.5												
1961																								
11 Western States	42.6	1.7	44.3	3.8	46.3	2.9	49.2	5.3	89.0	4.6	93.5	4.9	22.6	.0	22.6	.0	9.0	9.0	18.0	50.0	31.6	9.0	40.6	22.2
Other States	51.7	6.9	58.6	11.8	65.6	16.1	81.7	19.7	117.3	23.0	140.3	16.4	.0	.0	.0		.0	.0	.0		.0	.0	.0	
United States	94.3	8.6	102.9	8.3	111.9	19.0	131.0	14.5	206.3	27.6	233.8	11.9	22.6	.0	22.6	.0	9.0	9.0	18.0	50.0	31.6	9.0	40.6	22.2
1966																								
11 Western States	239.4	39.3	278.7	14.1	87.6	6.5	94.1	6.9	327.0	45.8	372.8	12.3	38.3	.0	38.3	.0	7.0	4.0	11.0	36.4	45.3	4.0	49.3	8.1
Other States	190.5	17.8	208.4	8.6	76.6	27.0	103.6	26.0	267.1	44.8	311.9	14.4	.0	.0	.0		.0	.0	.0		.0	.0	.0	
United States	429.9	57.1	487.0	11.7	164.2	33.5	197.7	16.9	594.2	90.6	684.7	13.2	38.3	.0	38.3	.0	7.0	4.0	11.0	36.4	45.3	4.0	49.3	8.1

TABLE VII-46

NATURAL AND ARTICIFIAL RESEEDING ON RANGE
CARRIED OUT UNDER FEDERAL COST SHARING
PROGRAMS (ASCS AND SCS) a/, 1957-1966

	Area (1,000 Acres)						Federal Expenditures (1,000 Dollars)						Private Expenditures (1,000 Dollars)						Total Cost (1,000 dollars)					
	1957	1959	1961	1963	1965	1966	1957	1959	1961	1963	1965	1966	1957	1959	1961	1963	1965	1966	1957	1959	1961	1963	1965	1966
Montana	4.0	239.3	725.6	974.7	1010.7	1058.2	10.45	18.95	52.74	212.16	491.6	509.58	10.45	14.05	37.76	81.14	221.29	206.12	20.9	33.0	130.5	293.3	712.9	715.7
Idaho	16.0	27.3	17.5	10.7	11.7	11.4	46.0	53.9	36.1	22.0	30.85	30.55	46.0	53.9	36.1	22.0	30.85	30.55	92.0	107.8	72.2	44.0	61.7	61.1
Wyoming	0.4	2.5	4.0	4.3	19.0	10.2	1.4	11.66	33.85	23.39	28.08	21.19	1.4	4.34	11.05	7.02	9.12	7.51	2.8	16.0	44.9	30.4	37.2	28.7
Colorado	13.7	133.0	78.3	78.6	89.4	63.8	38.7	95.39	106.14	120.32	229.18	318.29	38.7	37.60	37.56	38.38	107.82	122.11	77.4	133.0	143.7	158.7	336.8	440.4
New Mexico	3.1	10.8	23.9	34.1	23.3	22.9	5.1	79.32	56.98	61.88	80.09	90.06	5.1	65.68	48.12	33.72	69.01	77.34	10.2	145.0	105.1	115.6	149.1	167.4
Arizona	0.1	1.5	89.5	9.9	3.0	0.8	0.4	1.8	0.4	18.2	8.06	3.69	0.4	1.8	0.4	18.2	4.84	2.21	0.8	3.6	0.8	36.4	12.9	5.9
Utah	4.3	38.0	44.8	76.4	73.0	41.0	34.2	30.2	19.09	34.8	69.0	87.01	34.2	30.2	15.62	34.8	46.0	37.29	68.4	60.4	34.7	69.6	115.0	124.3
Nevada	4.8	5.8	5.4	4.4	14.0	11.8	6.03	6.80	6.75	8.85	15.16	22.9	6.67	7.51	6.75	8.85	16.75	22.9	12.7	14.3	13.5	17.7	31.9	45.8
Washington	1.2	53.3	53.5	59.4	71.1	66.1	4.85	12.55	13.6	12.95	20.3	22.61	4.85	12.55	13.6	12.95	20.5	9.88	9.7	25.1	27.2	25.9	41.0	32.3
Oregon	3.2	34.1	41.5	18.0	32.4	22.2	12.9	19.75	19.3	19.08	43.62	36.84	12.9	19.75	19.3	12.72	29.08	24.56	25.8	39.5	38.6	31.8	72.7	61.4
California	45.0	38.2	39.5	18.0	45.4	39.1	100.45	96.53	110.97	62.53	122.16	128.7	132.55	117.98	135.64	33.97	99.94	85.8	233.0	214.5	246.6	96.2	222.1	214.5
Total	100.0	399.8	1116.5	1286.5	1391.0	1370.5	258.48	426.84	495.92	596.16	1136.31	1271.42	283.22	365.36	361.9	323.75	654.97	624.08	541.7	792.2	857.8	919.6	1793.3	1897.5

a/ Agriculture Stabilization & Conservation Service

CONTROL OF COMPETITIVE SHRUBS ON RANGE,
CARRIED OUT UNDER FEDERAL COST SHARING PROGRAMS (ASCS and SCS) a/
1957 - 1966

	Area (1,000 Acres)						Federal Expenditures ($1,000)						Private Expenditure ($1,000)						Total Cost ($1,000)					
	1957 b/	1959	1961	1963	1965	1966	1957 b/	1959	1961	1963	1965	1966	1957 b/	1959	1961	1963	1965	1966	1957 b/	1959	1961	1963	1965	1966
Montana	4.7	5.3	8.1	25.6	41.0	61.6	21.9	11.75	26.85	55.70	79.45	112.65	21.9	11.75	26.85	55.70	79.45	112.65	43.8	23.5	53.7	111.4	158.9	225.3
Idaho	15.0	29.4	20.1	30.1	32.1	47.8	46.15	46.62	45.65	63.85	94.7	86.8	46.15	86.58	45.65	63.85	94.7	86.8	92.3	133.2	91.3	127.7	189.4	173.6
Wyoming	5.8	27.9	29.3	6.1	88.5	79.2	15.15	45.05	47.8	65.8	125.45	112.7	15.15	45.05	47.8	65.8	125.45	112.7	30.3	90.1	95.6	131.6	250.9	225.4
Colorado	12.7	38.3	86.9	61.6	70.9	52.5	38.8	100.98	141.36	130.68	164.13	136.56	38.8	100.82	94.24	87.12	123.48	91.04	77.6	201.8	235.6	217.8	289.6	227.6
New Mexico	30.2	71.7	106.7	88.8	104.8	145.5	59.65	202.71	236.99	198.54	313.19	387.35	59.65	77.79	121.81	164.76	247.11	311.25	119.3	280.5	378.8	363.3	560.3	698.6
Arizona	71.4	104.2	56.1	18.4	34.8	49.9	84.02	132.05	82.6	36.95	76.80	106.05	28.68	132.05	82.6	36.95	25.6	35.35	114.7	264.1	165.2	73.9	102.4	141.4
Utah	8.7	12.6	10.2	15.3	23.8	38.9	22.0	24.6	15.7	29.4	34.42	74.97	22.0	24.6	15.7	29.4	26.20	32.13	44.0	49.2	31.4	58.8	80.6	107.1
Nevada	3.7	8.6	8.8	12.7	13.6	9.1	12.7	21.50	17.8	32.6	29.8	23.6	12.7	21.50	17.8	32.6	29.8	23.6	25.4	43.0	35.6	75.2	59.6	47.2
Washington	2.5	6.5	6.0	7.1	6.0	5.1	15.5	25.0	20.05	20.8	21.7	18.8	15.5	25.0	20.05	20.8	21.7	18.8	31.0	50.0	40.1	41.6	43.4	37.6
Oregon	10.6	23.5	26.4	37.3	33.9	40.8	31.0	63.6	78.2	76.65	86.05	102.9	31.0	63.6	78.2	76.65	86.05	102.9	62.0	127.2	156.4	153.3	172.1	205.8
California	25.6	28.0	35.3	30.7	14.6	14.44	68.25	107.35	.0	.0	.0	88.35	68.25	107.35	246.4	318.8	139.4	88.35	136.5	214.7	246.4	318.8	139.4	176.7
Total	190.9	336.0	393.9	333.7	406.0	545.8	417.12	781.21	733.0	715.97	1045.67	1250.73	359.78	696.09	797.1	957.43	996.93	1015.57	776.9	1477.3	1530.1	1673.4	2042.6	2266.3

a/ Agriculture Stabilization & Conservation Service.
b/ In 1957, there was no SCS program.

TABLE VII-47

WATER DEVELOPMENT ON RANGE CARRIED OUT
UNDER FEDERAL COST SHARING PROGRAMS
(ASCS AND SCS)
1957-1966

	Area (1,000 Acres)						Federal Expenditures (1,000 Dollars)						Private Expenditures (1,000 Dollars)						Total Cost (1,000 Dollars)					
	1957 a/	1959	1961	1963	1965	1966	1957	1959	1961	1963	1965	1966	1957 a/	1959	1961	1963	1965	1966	1957 a/	1959	1961	1963	1965	1966
Montana	1,888	1,711	2,510	1,702	1,340	1,798	379.2	525.4	759.5	538.6	417.5	636.8	278.1	355.2	494.6	538.7	417.4	636.5	657.3	880.6	1,254.1	1,077.3	834.9	1,273.3
Idaho	156	229	261	239	165	257	28.4	34.9	39.4	37.1	31.0	53.6	30.0	36.7	33.4	36.9	31.0	53.6	58.4	71.6	72.8	74.0	62.0	107.2
Wyoming	1,004	1,033	919	578	601	638	496.95	479.7	379.75	325.65	275.20	290.15	396.55	272.6	287.65	88.25	168.1	176.55	893.5	752.3	667.4	413.9	443.3	466.7
Colorado	1,917	1,785	1,438	1,435	1,259	1,530	397.65	565.95	500.9	560.60	417.1	572.95	336.65	458.85	306.4	266.6	188.9	249.85	734.3	1,024.8	807.3	823.2	606.0	822.8
New Mexico	790	1,198	822	774	637	625	352.3	469.4	416.6	349.3	290.4	309.9	352.1	469.1	436.8	349.0	326.7	309.7	704.4	938.5	853.4	698.3	617.1	619.6
Arizona	340	259	204	118	112	116	213.0	150.0	137.9	90.9	83.75	111.2	212.9	151.4	137.8	91.0	92.85	111.0	425.9	301.4	275.7	181.9	176.6	222.2
Utah	192	323	366	221	130	149	25.3	36.0	68.9	37.4	26.75	28.45	28.4	35.9	68.9	37.3	28.3	28.25	53.7	71.9	137.8	74.7	55.0	56.7
Nevada	42	76	49	8	20	22	5.8	18.4	19.9	4.0	8.9	11.2	5.7	18.3	20.2	4.0	8.8	11.0	11.5	36.7	40.1	7.9	17.6	22.2
Washington	111	135	137	354	241	232	21.1	28.4	19.0	50.0	36.4	42.3	20.9	22.6	19.0	49.9	36.1	42.2	42.0	51.0	38.0	99.9	72.5	84.5
Oregon	235	260	501	252	117	299	23.7	44.8	43.1	40.8	32.7	60.4	23.5	44.7	43.0	40.6	32.7	60.3	47.2	89.5	86.1	81.4	65.4	120.7
California	505	627	698	348	318	329	183.75	313.60	289.05	163.6	133.25	144.85	183.65	615.0	307.15	168.5	94.15	110.95	367.4	928.6	596.2	332.1	227.4	255.8
Total	6,680	7,636	7,907	6,049	4,940	5,995	2,127.15	2,666.55	2,674.50	2,197.65	1,752.95	2,261.80	1,868.45	2,480.35	2,154.9	1,668.75	1,424.90	1,789.90	3,995.6	5,146.9	4,828.9	3,866.6	3,177.8	4,051.7

a/ In 1957 there was no SCS program.

TABLE VII-48

FENCING ON RANGE CARRIED OUT
UNDER FEDERAL COST SHARING PROGRAMS
1957-1966

	Area Fenced (1,000 Acres)						Federal Expenditures ($1,000)						Private Expenditures (1,000 Dollars)						Total Cost ($1,000)					
	1957 a/	1959	1961	1963	1965	1966	1957 a/	1959	1961	1963	1965	1966	1957 a/	1959	1961	1963	1965	1966	1957 a/	1959	1961	1963	1965	1966
Montana	1345.0	674.8	698.9	799.5	917.3	882.2	216.95	120.50	139.80	181.70	242.4	272.75	216.95	120.5	139.80	181.70	242.4	272.75	433.9	241.0	279.6	363.4	484.4	545.5
Idaho	69.9	106.6	49.5	71.1	63.6	46.8	29.15	50.8	27.50	47.4	54.05	46.75	29.15	50.8	27.50	47.4	54.05	46.75	58.3	101.6	55.0	94.8	108.1	93.5
Wyoming	622.5	738.6	480.1	408.2	239.7	196.8	127.04	160.44	123.1	120.04	83.6	81.25	155.26	212.67	123.1	187.76	83.6	81.25	282.3	373.1	246.2	307.8	167.2	162.5
Colorado	64.9	57.0	56.9	95.3	77.8	51.6	32.45	30.0	31.6	53.04	48.72	51.66	32.45	30.0	31.6	35.36	32.48	34.44	64.9	60.0	63.2	88.4	81.2	86.1
New Mexico	109.4	487.4	305.8	233.5	134.6	250.0	14.6	69.6	47.05	38.9	29.4	46.5	14.6	69.6	47.05	38.9	29.4	46.5	29.2	139.2	94.1	77.8	58.8	93.0
Arizona	132.0	167.7	92.8	139.7	159.6	102.9	18.85	25.8	17.2	32.5	30.64	102.9	18.85	25.8	17.2	32.5	33.76	68.60	37.7	51.6	34.4	65.0	84.4	171.5
Utah	150.5	178.8	194.7	164.9	183.5	222.7	57.9	74.5	88.52	82.44	102.30	138.08	57.9	74.5	132.78	145.56	370.50	235.12	115.8	149.0	221.3	229.0	272.8	373.2
Nevada	174.3	173.3	25.2	63.8	62.3	28.1	21.8	24.75	4.55	12.78	15.62	28.13	21.8	24.75	6.55	15.62	22.48	40.47	43.6	49.5	11.1	28.4	38.1	68.6
Washington	105.2	101.7	106.0	77.7	45.4	62.4	16.2	16.9	19.25	15.55	11.85	12.55	16.2	16.9	19.25	15.55	11.85	12.55	32.4	33.9	38.5	31.1	23.7	25.1
Oregon	72.8	65.7	66.6	71.1	37.1	39.3	19.7	14.3	21.5	25.4	15.0	17.55	19.7	14.3	21.5	25.4	15.0	17.55	39.4	28.6	43.0	50.8	30.0	35.1
California	166.5	186.2	202.9	116.1	80.8	42.8	46.25	58.2	69.95	44.65	34.65	42.85	46.25	58.2	69.95	44.65	34.85	42.85	92.5	116.4	139.9	89.3	69.3	85.7
Total	3013.0	2937.8	2279.4	2240.9	2001.7	1925.6	600.89	645.79	590.02	654.4	688.23	841.47	629.11	698.02	636.28	771.40	730.17	898.33	1230.0	1343.9	1226.3	1425.8	1418.0	1739.8

a/ In 1957, there was no SCS program

PERMANENT FENCES FOR LIVESTOCK
DISTRIBUTION ON RANGE
(SCS)
1957-1966

	Length of Fence (Miles)						Federal Expenditure (1,000 dollars)						Private Expenditures (1,000 Dollars)						Total Cost (1,000 Dollars)						
	1957	1959	1961	1963	1965	1966	1957	1959	1961	1963	1965	1966	1957	1959	1961	1963	1965	1966	1957	1959	1961	1963	1965	1966	
Montana	—	14	63	67	144	203	—	10.64	28.56	36.26	70.28	59.29	—	4.56	12.24	15.54	30.12	25.41	—	15.2	40.8	51.8	100.4	84.7	70% fed.
Colorado	—	21	46	92	92	121	—	8.4	18.13	33.04	36.82	49.84	—	3.6	7.77	14.16	15.78	21.36	—	12.0	25.9	47.2	52.6	71.2	
New Mexico	—	23	97	64	43	67	—	6.25	25.15	17.75	12.45	20.35	—	6.25	25.15	17.75	12.45	20.35	—	12.5	50.3	35.5	24.9	40.7	50% fed.
Wyoming	—	4	33	25	27	27	—	1.3	13.25	9.2	11.1	9.8	—	1.3	13.25	9.2	11.1	9.8	—	2.6	26.5	18.4	22.2	19.6	
TOTAL	—	62	239	248	306	418	—	26.59	85.09	96.25	130.65	139.28	—	15.71	58.41	56.65	69.45	76.92	—	42.3	143.5	152.9	200.1	216.2	

ANNUAL DEPRECIATION AND AVERAGE INVESTMENT SCHEDULE FOR EQUIPMENT AND IMPROVEMENTS TYPICAL ON MONTANA FARMS AND RANCHES*

The schedule of depreciation, investment, and repairs in this table was prepared through combining information from four different sources. It was hoped that this would provide quite reliable figures on 1963 costs. Such costs can then be carried forward as needed through use of the index number procedure. The sources used included a study by Kearl and Story of the University of Wyoming for the Bureau of Land Management, schedules of machinery prices from Leroy Rude of the Economic Research Service of the USDA at Bozeman, schedules of machinery prices taken from seven Billings and Hardin dealers in 1963, and schedules of building costs from local sources including the Farmers Home Administration in the fall, 1963.

The average investment in equipment was computed on the basis of

$$\frac{\text{1963 initial cost + 10\% salvage value}}{2}$$

One half of 1963 cost was used as the average investment in buildings, grain bins, fences, and wells. No salvage value was included as it was assumed removal cost would equal salvage.

Straight line depreciation was used for equipment and a salvage value of 10% was assumed.

$$\text{Depreciation} = \frac{\text{1963 cost - 10\% salvage value}}{\text{Expected life}}$$

Simple straight line depreciation was used for fences, buildings, and other permanent type improvements.

$$\text{Depreciation} = \frac{\text{1963 cost}}{\text{expected life}}$$

Repairs and maintenance were based on amounts reported by Kearl and Story and by the 1963 Agricultural Engineers Handbook, Table 4, p. 232.

*Reproduced from Sargent, Robert L., Alternatives for Developing Land on the Hardin Unit, Montana, Unpublished Ph.D. Dissertation, Montana State University, Bozeman; August, 1965.

TABLE VII-49
TABLE OF ANNUAL DEPRECIATION AND AVERAGE INVESTMENT SCHEDULE FOR EQUIPMENT AND IMPROVEMENTS TYPICAL ON MONTANA FARMS AND RANCHES

Item	Size	Life	Typical New 1963 Cost	Average Invest-ment	Annual Depre-ciation	Source*	Repair & Mainten-ance
Grain Drill (Double Disc)	10'	20	$ 940	$ 517	$ 42	2	8.0
	12'	20	1064	585	48	2	8.0
Shoe Drill (Deep Furrow)	12'	20	1263	695	57	2	8.0
	14'	20	1350	742	61	2	8.0
Grass Seeder	10'	20	90	50	4	3	8.0
	12'	20	110	60	5	3	8.0
Fertilizer Spreader	12'	20	425	234	19	3	8.0
Beet, Corn, & Bean Drill	6 R	15	1065	586	64	3	7.0
Cultivator - Beet, Bean, Corn	6 R	12	910	500	68	3	6.0
Harvesters:							
Ensilage Harvester	1 R PTO	10	2245	1235	202	3	2.9
	Motor	10	2885	1587	260	3	2.4
	2 R PTO	10	3255	1790	293	3	2.9
Beet Harvester	1 R	8	3870	2129	435	3	3.5
	2 R	10	6460	3553	581	3	3.5
Combine (Pull)	5'	10	2475	1361	223	1	4.5
(SP)	12'	10	7210	3965	649	3	2.7
Pickup Attach		10	435	239	39	3	2.7
Auger w/Motor	36'	15	560	308	33	3	2.5
Hay Equip:							
Mower	7'	12	522	287	39	1	12.0
Side Rake (Basket)	8'	12	624	343	47	1	7.0
Side Rake (Wheel)	9'	12	774	425	58	2	7.0

TABLE VII-49
TABLE OF ANNUAL DEPRECIATION AND AVERAGE INVESTMENT SCHEDULE FOR EQUIPMENT AND IMPROVEMENTS TYPICAL ON MONTANA FARMS AND RANCHES
(continued)

Item	Size	Life	Typical New 1963 Cost	Average Invest-ment	Annual Depre-ciation	Source*	Repair & Mainten-ance
Hay Equipment (Cont.)							
Dump Rake	12'	12	$ 299	$ 162	$ 22	1	7.0
	21'	12	968	532	73	1	7.0
Baler (Twine)	PTO	10	2229	1227	200	1	3.1
(Wire)	PTO	10	2869	1577	258	1	3.1
(Wire) HD	Motor	10	4098	2254	369	1	2.2
Bale Elevator	36'	15	491	273	29	1	2.5
Swather HD	12'	10	4180	2299	376	3	4.0
Hay Conditioner for Swather		10	810	445	73	3	4.0
Farmhand (3 Baskets & Pushoff)		10	1530	842	138	3	5.0
Misc:							
Leveler	9'	12	1045	575	78	3	3.0
Ditcher	6'	10	365	201	33	3	3.0
Manure Spreader		12	660	363	49	3	1.0
Feeder Box w/Running Gear		12	1995	1097	150	3	1.0
Wagon w/Box		15	430	236	28	1	2.5
Backfill Blade		15	215	118	13	3	3.0
Sprayer Boom & Tank	PTO	10	455	250	41	3	3.1
Sled		15	344	200	20	1	1.7
Scales		20	1614	888	73	1	.5
Squeeze Chute		15	350	193	22	1	.8
Calf Table		15	231	127	14	1	.7
Feed Grinder-Mixer		10	1800	990	162	3	5.0
Carryall Scraper	2 1/2 yd	12	1150	632	86	3	3.0
Fuel Tanks	300 gal.	20	163	89	8	1	1.2
	500 gal.	20	188	103	9	1	1.2
Horse Trailer				250			
Utility Trailer				200			
Grinder				250			

TABLE VII-49
ANNUAL DEPRECIATION AND AVERAGE INVESTMENT SCHEDULE FOR EQUIPMENT AND IMPROVEMENTS TYPICAL ON MONTANA FARMS AND RANCHES
(continued)

Item	Size	Life	Typical New 1963 Cost	Average Investment	Annual Depreciation	Source*	Repair & Maintenance
Vehicles:							
Pickup	1/2 Ton	10	$2367	$1302	$213	1	See
Truck (Inc. Box & Hoist)	2 Ton	12	5272	2899	395	3	Separate
Jeep		10	2690	1479	242	1	Schedule
4 Wheel Drive Pickup	1/2 Ton	10	3443	1894	310	1	
Auto Class I - 120 x 160		8	2770	1524	312	2	
Class II - 240 x 320		8	3236	1780	364	2	
Class III-400		8	4368	2402	491	Est.	
Truck	3/4 Ton			1700			
	1 1/2 Ton			2500			
	2 1/2 Ton			3300			
						Ave./100 Hours % of New Cost	
Wheel Tractors:							
Gasoline:							
1-2 Plow	20 HP	12	2605	1433	195	1	1.0
2 Plow	30 HP	12	2929	1611	220	2	1.0
3 Plow	40 HP	12	3955	2176	297	2	1.0
4 Plow	50 HP	12	4728	2600	355	2	1.0
5 Plow	60 HP	12	5796	3188	434	2	1.0
Diesel:							
4 Plow	50 HP	12	5095	2802	382	2	1.0
5 Plow	60 HP	12	6667	3667	500	2	1.0
6 Plow	70 HP	12	8047	4426	604	2	1.0
	80 HP			4800			

TABLE VII-49
TABLE OF ANNUAL DEPRECIATION AND AVERAGE INVESTMENT SCHEDULE FOR EQUIPMENT AND IMPROVEMENTS TYPICAL ON MONTANA FARMS AND RANCHES
(continued)

Item	Size	Life	Typical New 1963 Cost	Average Investment	Annual Depreciation	Source*	Repair & Maintenance
Track-Diesel:							
	20 HP			$2300			
	35 HP			2900			
	40 HP			3500			
D-2	50 HP	10	$ 9048	4976	$ 815	1	.65
D-4	60 HP	10	12179	6698	1096	1	.65
D-6	70 HP	10	18714	10293	1684	1	.65
D-7	100+	10	24000	13200	2160	Est.	.65
Tool Bar	6'			250			
	7'			300			
8'	8'	15	718	395	43	2	6.0
10'	10'	15	1068	587	64	2	6.0
12'	12'	15	1251	688	75	2	6.0
14'	14'	15	1387	739	83	2	6.0
16'	16'	15	1453	799	87	2	6.0
Disc (Wheel Carrier)	8'	15	780	429	47	3	6.5
	10'	15	945	520	57	3	6.5
	12'	15	1192	655	72	3 Est.	6.5
Plow (Mold Board)	2 B	15	418	230	25	2	7.0
	3 B	15	707	389	42	2	7.0
	4 B	15	962	529	58	2	7.0
	5 B	15	1234	678	74	2	7.0
(Spinner)	2 B	10	825	454	74	3	7.0
	3 B	10	1090	599	98	3	7.0
Spike Harrow w/Evener	Per 5' Sec.	20	59	32	2	3	4.0
Spring Tooth	Per 8' Sec.	15	216	118	13	1	4.0

TABLE VII-49
TABLE OF ANNUAL DEPRECIATION AND AVERAGE INVESTMENT SCHEDULE FOR EQUIPMENT AND IMPROVEMENTS TYPICAL ON MONTANA FARMS AND RANCHES
(continued)

Item	Size	Life	Typical New 1963 Cost	Average Invest ment	Annual Depre- ciation	Source*	Repair & Mainten- ance
Saddle				$ 75.00			Annual Repair % of Cost
Welder	1.80 Arc	20	$ 225.00	129.00	$ 10.00	Est.	3.0
Dwelling House	Sq. Ft.	40	14.00	7.00	.35	4	2.0
Min. Dwelling or Modern Labor House		40	10.00	5.00	.25	4	2.0
Labor House (Min.)		30	5.50	2.75	.18	4	2.0
Open Shed - Steel RW, Wood Frame, 3 Walls		30	1.85	.93	.06	4	1.0
Open Shed - Wood RW, Wood Frame		30	2.05	1.02	.07	4	1.0
Shed - Steel RW, Wood Frame, 4 Walls		30	2.25	1.12	.075	4	1.0
Shed - All Wood, 4 Walls		30	2.45	1.22	.08	4	1.0
Concrete Floor, 4" Reinf.		30	.60	.30	.02	4	1.0
Concrete Block Shop, Steel Reinf.		40	2.95	1.47	.74	4	1.0
Grain Bins	1000 bu.	20	460.00	230.00	23.00	4	3.0
	2250 bu.	20	725.00	362.00	36.25	4	3.0
Fence/Mile	3 Wire	15	560.00	280.00	37.33	4	10.0
	4 Wire	15	610.00	305.00	40.67	4	10.0
Woven Wire		15	765.00	382.00	51.00	4	10.0
	3 Wire	25	560.00	280.00	22.40	4	10.0
	4 Wire	25	610.00	305.00	24.40	4	10.0
Woven Wire		25	765.00	382.00	30.60	4	10.0
Corral Fence (Cattle) Per Ft.		15	2.00	1.00	.13	4	10.0
Well, Windmill, Pump, Tank		30	1500.00	750.00	50.00	4	5.0
Well, Domestic, Elec. Pump		30	750.00	375.00	25.00		3.0

*Source - 1 - BLM - Indexed (1947-49 = 100)
2 - Rude - Indexed (1947-49 = 100)
3 - Schedule of 7 Billings and Hardin Dealers (1963 Prices)
4 - Degn-Sargent From Bozeman Sources (1963 Prices)

Federal Land Grazing Fees

Mathematical Model of W-79 Data

Since completion of the regression analysis of the W-79 data, a review has been made to determine the effect of the early decision to omit the cost of the federal land grazing fees. This review supports that decision.

The net effect upon the "Adjusted Average Cost" of producing beef by an average federal grazing fee was calculated. It was necessary to assume a value for the fee because in fact it varied from the Bureau of Land Management to the U.S. Forest Service over a range from $.33 to about $2.00 per AUM. The average value, of $.40, used however is probably valid when considering all areas together.

For all areas combined, the effect of the federal grazing fee was an additional cost of $.44 per hundredweight. This would correct the "Adjusted Average Cost of Beef" for all areas from $24.86 to $25.30 per hundredweight.

To make the same calculation for the individual areas would be meaningless for 2 reasons. (1) The average fee for an individual area would be the weighted average of Bureau of Land Management and U.S. Forest Service fees paid--which information is not available and would be exceedingly hard to estimate. (2) The "b_i" values to be used in the calculation were not statistically significant in the Southern Desert and Intermountain Areas. Therefore, only the effect of federal land fee on the "Adjusted Average Cost" of beef for all four areas combined has been calculated.

The early decision to omit the cost of federal grazing fees in this analysis is supported on two points:

1. The wide variation in fees would have introduced a major uncontrolled variable which would have upset the correlation and would have prevented inter-regional comparisons; and
2. The small effect ($.44) on the overall cost of beef estimate shows that the absolute error is small.

Effect of Average Grazing Fee on Adjusted Average Cost

Use Equation No. 2 (p. III-87)
Ref. Tables III C-64 (opp. p. III-88)

Say Avg. fee = 40¢
Avg. animal = 300 lbs. = 3 cwt.

$b_1 = -0.217$ $/(cwt)(mo)

$x_1 = 3.30$ (mo)/(yr)
$Y = 24.86$ $/cwt

$$\frac{(0.40)(3.30)}{(3.0)} = \$0.440/\text{cwt}$$

$24.86 + 0.44 = $25.30/cwt

County Questionnaire

The questionnaire was designed to obtain information from the permittees on certain questions and to establish the type and size of each ranch reporting. The primary data desired were as follows:

1. Size and type of ranch.
2. Amount of public land grazed and agency jurisdiction.
3. Proportion of total income from off-ranch sources.
4. Duration of ranch ownership.
5. Proportion of owners having acquired ranch in open market.
6. Frequency of permit transfers.
7. Relationship of purchases to sales.

Considerable time was spent in the simplification of questions and maintaining the limit of a single page questionnaire.

Questionnaire Summaries

The livestock distribution was developed as a percentage (yearlings, calves, etc.) of the total number of cows and bulls.

The number of animal units, "AU's," was calculated according to the Range Management Glossary.

Although the questionnaire requested an indication of the "type of operation," the returns showed that the various ranchers used different criteria for these categories. It was therefore necessary to develop a standardized procedure for making this classification. The steps are given below:

1. Compare AU's of cows and yearlings to AU's of sheep, horses and goats.
   (a) If greater; operation is either cow-calf, cow-yearling, or yearling.
   (b) If less; operation is either sheep or goats or horses.

2. Compare number of yearlings to total of cows and bulls.
   (a) If greater; operation is yearling.
   (b) If less; operation is cow-calf or cow-yearling.

3. Compare number of calves to 70 percent of total of calves and yearlings.
   (a) If greater; operation is cow-calf.
   (b) If less; operation is cow-yearling.

4. Compare AU's of sheep to total AU's of goats and horses.
   (a) If greater; operation is sheep.
   (b) If less; operation is either horses or goats.

5. Compare AU's of goats to AU's of horses.
   (a) If greater; operation is goats.
   (b) If less; operation is horses.

It must be noted that percentages of spring and fall calves bear no relation to calf crop because no data was obtained on calf inventory changes.

The percentages of ranches using federal lands total about 133. This is more than 100 because many ranchers have permits from several agencies.

Income Distribution

The income distribution for the counties and for the whole sample was determined by weighting each rancher reported percentage by the number of AU's in the ranch.

To calculate income distribution, the total income for a particular ranch is computed as: Total Income = $N/_p \times V$, where N is total AU's on the ranch, P is the percent of total income represented by livestock, and V represents income per AU. Livestock income is then: Livestock Income = LI=TI x P=N x V. Other ranch income is: OR = TI x P = $N/p \times V \times P$

The values of livestock income, other ranch income, and off-ranch income are calculated for each ranch and these values summed for each state. Thus, for each state:

$$\% \text{ Income represented by livestock} = \frac{LI}{TI} = \frac{N \times V + N \times V + \ldots}{\frac{N}{P} \times V + \frac{N}{P} + \ldots}$$

The V's cancel, leaving: $$\frac{LI}{TI} = \frac{N + N + \ldots}{\frac{N}{P} + \frac{N}{P} + \ldots}$$

By a similar procedure:

$$\% \text{ Income by other ranch income} = \frac{OR}{TI} \frac{\frac{N}{R} \times P + \frac{N}{P} \times P + \ldots}{\frac{N}{P} + \frac{N}{P} + \ldots}$$

$$\% \text{ Income by off-ranch} = \frac{OFF}{TI} \frac{\frac{N}{P} \times P + \frac{N}{P} \times P + \ldots}{\frac{N}{P} + \frac{N}{P} + \ldots}$$

This procedure is used both for all ranches in the state and for only those ranches with 150 AU's or fewer. Note that income per AU is considered to be constant for all sizes and types of ranches.

If the percent of income represented by livestock is zero, the ratio TI = $N/_P$ is undefined. Therefore, ranches with no livestock income had to be ignored in the computation of total income, and therefore in the income distribution calculations.

The questionnaire used to obtain this data is shown on Figure VII-15.

The classifications, percentages, and values described above have been developed and summarized for each of the eight counties and for the total on Tables VII-51-59 inc. following.

Figure VII-15

UNIVERSITY OF IDAHO FORAGE STUDY
For Public Land Law Review Commission

No._____

Date_____

PART I: COUNTY QUESTIONNAIRE

1. a. Present Number of Total Livestock in Your Ranch Operation

Cows & Bulls _____ Calves - Spring _____

Yearlings - Long _____ Ewes & Rams _____

Yearlings - Short_____ Does & Bucks _____

Calves - Fall _____ Horses _____

b. Type of Livestock Operation (Indicate Primary "1" & Secondary "2", etc.)

a. Cow calf _____ d. Sheep _____

b. Cow yearling _____ e. Goats _____

c. Yearling _____ f. Horses _____

2. Total Number AUM's In Your Ranch Permits & Licenses _____

Average Per Cent of Under Six Months: Calves, Lambs & Kids grazed with above.

Cows with Calves _____% Ewes with Lambs_____% Does with Kids_____%

Federal Lands Used: ("X" the following that you use)

BLM District ___ BLM Section 15___ National Forest___ L.U.___

Game Refuge___ Nat'l.Grassland___ Defense___ Other___

3. Last Year: Total Ranch Income as _____ 100 %

Livestock Income _____%

Other Ranch Income _____%

Off Ranch Income _____% (Wages & Salaries both Husband & Wife)

4. Ranch Acquired When _____ or Years Owned _____

From Whom _____Relationship (father, aunt, etc.)_____

5. Transfers of Permits or Licenses Since 1953: No_____ Yes_____

Purchase_____ Sale_____ No. of Transfers_____ Agency: BLM____ F.S.____

With: Land____ Animals____ Land & Animals____ Neither____

Date Last Transfer _____ Within Family: No____ Yes____

Relationship_____

Other Party Name_____

Address_____

TABLE VII-51

COUNTY QUESTIONNAIRE SUMMARY: GRAHAM COUNTY, ARIZONA

RESPONSE: Ranches 25 — Total AU's 9,795

LIVESTOCK DISTRIBUTION
To Total Cows & Bulls

Number of Yearlings	36.0%	Number of Horses	2.5%
Fall Calves	8.8%	Sheep	0.0%
Spring Calves	46.1%	Goats	0.0%
AU's: Cows, Bulls & Yearlings	97.6%		
AU's: Horses	2.4%		
AU's: Sheep & Goats	0.0%		

PRIMARY TYPE OF OPERATION BY RANCHES:

Cow-Calf	72.0%	Yearling	8.0%	Goats	0.0%
Cow-Yearling	20.0%	Sheep	0.0%	Horses	0.0%

Ranches with Combined Cattle & Sheep Operation 0.0%

FEDERAL AUM's TO TOTAL USE: 32.6% — NON-USE TO TOTAL USE 1.7%

FEDERAL LANDS USE	PERCENT OF RANCHES
BLM District	60.0%
BLM Section 15	20.0%
National Forest	56.0%
L.U.	0.0%
Game Refuge	0.0%
National Grassland	0.0%
Dept. of Defense	0.0%
Other	8.0%

INCOME DISTRUBUTION:	ALL RANCHES	UNDER 151 AU's
Livestock Income	72.7%	40.0%
Other Ranch Income	8.8%	30.8%
Off Ranch Income	18.5%	29.2%

AVERAGE NUMBER OF YEARS RANCH OWNED 21.6 YEARS

RANCH ACQUIRED FROM: Related 24.0%
Not-Related 76.0%
Homestead 0.0%

TRANSFERS OF PERMITS OR LICENSES SINCE 1953: TOTAL 13
Ranches with Transfers: To Total Ranches 20.0%
Average Number of Transfers 2.6%
TYPE: Purchases 12 AGENCY: BLM 6
Sales 1 F.S. 7
AVERAGE DATE OF LAST TRANSFER 1964
OTHER PARTY: Related 40.0 Not-Related 60.0

TABLE VII-52

COUNTY QUESTIONNARIE SUMMARY: LEMHI COUNTY, IDAHO

RESPONSE: Ranches 54

Total AU's 15,616

LIVESTOCK DISTRIBUTION

To Total Cows & Bulls

Number of Yearlings 28.4%
Fall Calves 4.1%
Spring Calves 75.7%
AU's: Cows, Bulls & Yearlings 81.7%
AU's: Horses 3.9%
AU's: Sheep & Goats 14.4%

Number of Horses 4.6%
Sheep 107.0%
Goats 0.0%

PRIMARY TYPE OF OPERATION BY RANCHES:

Cow-Calf 70.4%
Cow-Yearling 14.8%
Yearling 5.6%
Sheep 7.4%
Goats 0.0%
Horses 1.9%
Ranches with Combined Cattle & Sheep Operation 5.6%

FEDERAL AUM'S TO TOTAL USE 20.8%

NON-USE TO TOTAL USE 3.8%

FEDERAL LANDS USE	PERCENT OF RANCHES
BLM District	88.9%
BLM Section 15	1.9%
National Forest	51.9%
L.U.	0.0%
Game Refuge	0.0%
National Grassland	0.0%
Dept. of Defense	0.0%
Other	1.9%

INCOME DISTRIBUTION	ALL RANCHES	UNDER 151 AU's
Livestock Income	88.8%	67.8%
Other Ranch Income	0.9%	2.1%
Off-Ranch Income	10.3%	30.1%

AVERAGE NUMBER OF YEARS RANCH OWNED 18.9 YEARS

RANCH ACQUIRED FROM: Related 33.3%
Not-Related 66.7%
Homestead 0.0%

TRANSFERS OF PERMITS OR LICENSES SINCE 1953: TOTAL 19

Ranches with Transfers: To Total Ranches 24.1%
Average Number of Transfers 1.5%

TYPE: Purchases 15
Sales 4

AGENCY: BLM 6
F.S. 13

AVERAGE DATE OF LAST TRANSFER 1963

OTHER PARTY: Related 33.3 Not-Related 66.7

TABLE VII-53

COUNTY QUESTIONNAIRE SUMMARY: BLAINE COUNTY, MONTANA

RESPONSE: Ranches 25

Total AU's 7,870

LIVESTOCK DISTRIBUTION

To Total Cows & Bulls

Number of Yearlings 27.3%
Fall Calves 0.0%
Spring Calves 88.6%
AU's: Cows, Bulls & Yearlings 98.4%
AU's: Horses 1.6%
AU's: Sheep & Goats 0.0%

Number of Horses 1.6%
Sheep 0.0%
Goats 0.0%

PRIMARY TYPE OF OPERATION BY RANCHES:

Cow-Calf 76.0%
Cow-Yearling 16.0%
Yearling 8.0%
Sheep 0.0%
Goats 0.0%
Horses 0.0%
Ranches with Combined Cattle & Sheep Operation 0.0%

FEDERAL AUM'S TO TOTAL USE 12.8%

NON-USE TO TOTAL USE 1.7%

FEDERAL LANDS USE	PERCENT OF RANCHES
BLM District	60.0%
BLM Section 15	0.0%
National Forest	0.0%
L.U.	52.0%
Game Refuge	0.0%
National Grassland	0.0%
Dept. of Defense	0.0%
Other	0.0%

INCOME DISTRIBUTION	ALL RANCHES	UNDER 151 AU's
Livestock Income	65.4%	30.8%
Other Ranch Income	19.4%	45.8%
Off-Ranch Income	15.2%	23.4%

AVERAGE NUMBER OF YEARS RANCH OWNED 21.6 YEARS

RANCH ACQUIRED FROM: Related 28.0%
Not-Related 64.0%
Homestead 8.0%

TRANSFERS OF PERMITS OR LICENSES SINCE 1953: TOTAL 6

Ranches with Transfers: To Total Ranches 20.0%
Average Number of Transfers 1.2%

TYPE: Purchases 6
Sales 0

AGENCY: BLM 6
F.S. 0

AVERAGE DATE OF LAST TRANSFER 1963

OTHER PARTY: Related 0.0 Not-Related 100.0

TABLE VII-54

COUNTY QUESTIONNAIRE SUMMARY: ELKO COUNTY, NEVADA

RESPONSE: Ranches 52

Total AU's 64,009

LIVESTOCK DISTRIBUTION

To Total Cows & Bulls

Number of yearlings 31.6%
Fall Calves 20.7%
Spring Calves 49.4%
AU's: Cows, Bulls & Yearlings 87.3%
AU's: Horses 2.5%
AU's: Sheep & Goats 10.2%

Number of Horses 2.8%
Sheep 72.5%
Goats 0.0%

PRIMARY TYPE OF OPERATION BY RANCHES:

Cow-Calf 50.0%
Cow-Yearling 34.6%
Yearling 3.8%
Sheep 7.7%
Goats 0.0%
Horses 3.8%
Ranches with Combined Cattle & Sheep Operation 1.9%

FEDERAL AUM'S TO TOTAL USE 39.0%

NON-USE TO TOTAL USE 5.6%

FEDERAL LANDS USE	PERCENT OF RANCHES
BLM District	92.3%
BLM Section 15	0.0%
National Forest	57.7%
L.U.	0.0%
Game Refuge	1.9%
National Grassland	0.0%
Dept. of Defense	0.0%
Other	0.0%

INCOME DISTRIBUTION	ALL RANCHES	UNDER 151 AU's
Livestock Income	82.2%	22.5%
Other Ranch Income	4.5%	5.9%
Off-Ranch Income	13.3%	71.6%

AVERAGE NUMBER OF YEARS RANCH OWNED 18.9 YEARS

RANCH ACQUIRED FROM: Related 39.2%
Not-Related 60.8%
Homestead 0.0%

TRANSFERS OF PERMITS OR LICENSES SINCE 1953: TOTAL 40

Ranches with Transfers: To Total Ranches 40.4%
Average Number of Transfers 1.9%

TYPE: Purchases 35 AGENCY: BLM 28
Sales 5 F.S. 12

AVERAGE DATE OF LAST TRANSFER 1964

OTHER PARTY: Related 38.9 Not-Related 61.1

TABLE VII-55

COUNTY QUESTIONNAIRE SUMMARY: CHAVES COUNTY, NEW MEXICO

RESPONSE: Ranches 56

Total AU's 23,451

LIVESTOCK DISTRIBUTION

To Total Cows & Bulls

Number of Yearlings 42.6%
Fall Calves 18.3%
Spring Calves 40.6%
AU's: Cows, Bulls & Yearlings 56.6%
AU's: Horses 2.2%
AU's: Sheep & Goats 41.2%

Number of Horses 4.1%
Sheep 473.3%
Goats 5.4%

PRIMARY TYPE OF OPERATION BY RANCHES:

Cow-Calf 47.4%
Cow-Yearling 77.0%
Yearling 7.0%
Sheep 36.8
Goats 0.0%
Horses 1.8%
Ranches with Combined Cattle & Sheep Operation 10.5%

FEDERAL AUM'S TO TOTAL USE 36.8%

NON-USE TO TOTAL USE 6.2%

FEDERAL LANDS USE	PERCENT OF RANCHES
BLM District	96.5%
BLM Section 15	7.1%
National Forest	7.1%
L.U.	0.0%
Game Refuge	1.8%
National Grassland	0.0%
Dept. of Defense	0.0%
Other	1.8%

INCOME DISTRIBUTION	ALL RANCHES	UNDER 151 AU's
Livestock Income	56.6%	24.3%
Other Ranch Income	1.5%	1.0%
Off Ranch Income	41.9%	74.7%

AVERAGE NUMBER OF YEARS RANCH OWNED 21.3 YEARS

RANCH ACQUIRED FROM: Related 38.6%
Not-Related 56.1%
Homestead 5.3%

TRANSFERS OF PERMITS OR LICENSES SINCE 1953: TOTAL 23

Ranches with Transfers: To Total Ranches 28.2%
Average Number of Transfers 1.4%

TYPE: Purchases 19 AGENCY: BLM 22
Sales 4 F.S. 1

AVERAGE DATE OF LAST TRANSFER 1965

OTHER PARTY: Related 60.0 Not-Related 40.0

TABLE VII-56

COUNTY QUESTIONNAIRE SUMMARY: BAKER COUNTY, OREGON

RESPONSE: Ranches 42

Total AU's 15,028

LIVESTOCK DISTRIBUTION

To Total Cows & Bulls

Number of Yearlings 27.8%
Fall Calves 13.3%
Spring Calves 65.5%
AU's: Cows, Bulls & Yearlings 98.4%
AU's: Horses 1.5%
AU's: Sheep & Goats .1%

Number of Horses 1.5%
Sheep 0.6%
Goats 0.0%

PRIMARY TYPE OF OPERATION BY RANCHES:

Cow-Calf 71.4%
Cow-Yearling 23.8%
Yearling 4.8%
Sheep 0.0%
Goats 0.0%
Horses 0.0%
Ranches with Combined Cattle & Sheep Operation 0.0%

FEDERAL AUM'S TO TOTAL USE 12.6%

NON-USE TO TOTAL USE 2.8%

FEDERAL LANDS USE	PERCENT OF RANCHES
BLM District	88.1%
BLM Section 15	0.0%
National Forest	35.7%
L.U.	0.0%
Game Refuge	0.0%
National Grassland	0.0%
Dept. of Defense	0.0%
Other	2.4%

INCOME DISTRIBUTION	ALL RANCHES	UNDER 151 AU's
Livestock Income	85.6%	63.5%
Other Ranch Income	4.0%	3.5%
Off Ranch Income	10.4%	33.0%

AVERAGE NUMBER OF YEARS RANCH OWNED 20.0 YEARS

RANCH ACQUIRED FROM: Related 43.9%
Not-Related 53.7%
Homestead 2.4%

TRANSFERS OF PERMITS OR LICENSES SINCE 1953: TOTAL 14
Ranches with Transfers: To Total Ranches 21.4%
Average Number of Transfers 1.6%
TYPE: Purchases 11
Sales 3
AGENCY: BLM 8
F.S. 6
AVERAGE DATE OF LAST TRANSFER 1963
OTHER PARTY: Related 12.5 Not-Related 87.5

TABLE VII-57

COUNTY QUESTIONNAIRE SUMMARY: SAN JUAN COUNTY, UTAH

RESPONSE: Ranches 24

Total AU's 12,164

LIVESTOCK DISTRIBUTION:

To Total Cows & Bulls

Number of Yearlings 16.4%
Fall Calves 3.1%
Spring Calves 57.3%
AU's: Cows, Bulls & Yearlings 59.6%
AU's: Horses 2.8%
AU's: Sheep & Goats 37.6%

Number of Horses 4.2%
Sheep 355.9%

PRIMARY TYPE OF OPERATION BY RANCHES:

Cow-Calf 75.0%
Cow-Yearling 8.3%
Yearling 0.0%
Sheep 16.7%
Goats 0.0%
Horses 0.0%
Ranches with Combined Cattle & Sheep Operation 4.2%

FEDERAL AUM'S TO TOTAL USE 52.6%

NON-USE TO TOTAL USE 9.8%

FEDERAL LANDS USE	PERCENT OF RANCHES
BLM District	95.8%
BLM Section 15	4.2%
National Forest	70.8%
L.U.	0.0%
Game Refuge	0.0%
National Grassland	0.0%
Dept. of Defense	0.0%
Other	4.2%

INCOME DISTRIBUTION	ALL RANCHES	UNDER 151 AU's
Livestock Income	73.4%	34.9%
Other Ranch Income	13.5%	21.9%
Off Ranch Income	13.1%	43.2%

AVERAGE NUMBER OF YEARS RANCH OWNED 21.2 YEARS

RANCH ACQUIRED FROM: Related 43.5%
Not-Related 52.2%
Homestead 4.3%

TRANSFERS OF PERMITS OR LICENSES SINCE 1953: TOTAL 25
Ranches with Transfers: To Total Ranches 45.8%
Average Number of Transfers 2.1%
TYPE: Purchases 21
Sales 4
AGENCY: BLM 14
F.S. 11
AVERAGE DATE OF LAST TRANSFER 1961
OTHER PARTY: Related 33.3 Not-Related 66.7

TABLE VII-58

COUNTY QUESTIONNAIRE SUMMARY: JOHNSON COUNTY, WYOMING

RESPONSE: Ranches 49 — Total AU's 29,999

LIVESTOCK DISTRIBUTION

To Total Cows & Bulls

Number of Yearlings	54.4%	Number of Horses	4.1%
Fall Calves	6.4%	Sheep	701.5%
Spring Calves	82.1%	Goats	4.4%
AU's: Cows, Bulls & Yearlings	49.0%		
AU's: Horses	1.8%		
AU's: Sheep & Goats	49.2		

PRIMARY TYPE OF OPERATION BY RANCHES:

Cow-CAlf	38.8%	Yearling	6.1%	Goats	0.0%
Cow-Yearling	18.4%	Sheep	36.7%	Horses	0.0%

Ranches with Combined Cattle & Sheep Operation 18.4%

FEDERAL AUM'S TO TOTAL USE 7.5% — NON-USE TO TOTAL USE 0.0%

FEDERAL LANDS USE	PERCENT OF RANCHES
BLM District	0.0%
BLM Section 15	85.7%
National Forest	24.5%
L.U.	0.0%
Game Refuge	0.0%
National Grassland	0.0%
Dept. of Defense	0.0%
Other	0.0%

INCOME DISTRIBUTION	ALL RANCHES	UNDER 151 AU's
Livestock Income	80.0%	53.3%
Other Ranch Income	9.2%	1.0%
Off Ranch Income	10.8%	45.7%

AVERAGE NUMBER OF YEARS RANCH OWNED 20.1 YEARS

RANCH ACQUIRED FROM: Related 44.9%; Not-Related 53.1%; Homestead 2.0%

TRANSFERS OF PERMITS OR LICENSES SINCE 1953: TOTAL 17

Ranches with Transfers: To Total Ranches 24.5%; Average Number of Transfers 1.4%

TYPE: Purchases 17, Sales 0 — AGENCY: BLM 12, F.S. 5

AVERAGE DATE OF LAST TRANSFER 1962

OTHER PARTY: Related 45.5 Not-Related 54.5

TABLE VII-59

COUNTY QUESTIONNAIRE SUMMARY: TOTAL EIGHT COUNTIES

RESPONSE: Ranches 327 — Total AU's 177,947

LIVESTOCK DISTRIBUTION

To Total Cows & Bulls

Number of Yearlings	33.2%	Number of Horses	3.1%
Fall Calves	13.6%	Sheep	172.9%
Spring Calves	58.6%	Goats	0.9%
AU's: Cows, Bulls & Yearlings	76.3%		
AU's: Horses	2.3%		
AU's: Sheep & Goats	21.4%		

PRIMARY TYPE OF OPERATION BY RANCHES:

Cow-Calf	59.5%	Yearling	5.5%	Goats	0.0%
Cow-Yearling	18.3%	Sheep	15.5%	Horses	1.2%

Ranches with Combined Cattle & Sheep Operation 6.1%

FEDERAL AUM'S TO TOTAL USE 29.4% — NON-USE TO TOTAL USE 4.2%

FEDERAL LANDS USE	PERCENT OF RANCHES
BLM District	73.5%
BLM Section 15	16.2%
National Forest	36.6%
L.U.	4.0%
Game Refuge	0.6%
National Grassland	0.0%
Dept. of Defense	0.0%
Other	1.8%

INCOME DISTRIBUTION	ALL RANCHES	UNDER 151 AU's
Livestock Income	75.9%	39.3%
Other Ranch Income	6.0%	13.2%
Off Ranch Income	18.1%	47.5%

AVERAGE NUMBER OF YEARS RANCH OWNED 20.2 YEARS

RANCH ACQUIRED FROM: Related 37.8%; Not-Related 59.7%; Homestead 2.5%

TRANSFERS OF PERMITS OR LICENSES SINCE 1953: TOTAL 157

Ranches with Transfers: To Total Ranches 28.4%; Average Number of Transfers 1.7%

TYPE: Purchases 136, Sales 21 — AGENCY: BLM 102, F.S. 55

AVERAGE DATE OF LAST TRANSFER 1963

OTHER PARTY: Related 37.8% Not-Related 62.2%

Range Livestock Industry Influence on Economy of Eight Counties

The purpose of the income analysis of the eight surveyed counties is first, to assess the relative importance of the range livestock industry to the income of those counties, and second, to determine what effect a change in the prosperity or stability of the livestock industry may have on these counties.

There are several techniques for analyzing the income effects in a region. The best known of these is the input-output analysis. This procedure takes the sales (representing the outputs) for the area and distributes them to the purchasers. It also determines inputs from all transactions for the various parts of the local economy. However, in a small area (county rather than state) many products are shipped out without primary or secondary processing. Many purchases of supplies, of wholesale and even retail commodities, are made outside the area. This causes multipliers to be low, to vary greatly with different industries, and to be much harder to estimate than in a more mature economy. Hence the input-output analysis is inappropriate for this study.

For cases with large exports, some studies have tried to measure what is called an export multiplier. Here the new dollars brought in by exports are used as a basis upon which to apply multipliers for estimating the expenditures of other local industries. The difficulty with this approach is that it does not evaluate the balance of payment, or import items. It is also weak in the development and application of multipliers for non-export sources of outside dollars such as the U.S. Air Force base in Chaves County or the tourist and gambling income of Elko County. Therefore another method must be used for these analysis.

A Bureau of Reclamation study procedure which begins with an analysis of the basic industries of the area has been chosen. This method solves the problem mentioned above by its definition of basic industries. These are all of those which do not depend on the location of other industries. Included therefore are tourism, universities, and federal installations as well as the usual "basics" of mining, manufacturing, etc. After the basic industries, the secondary, which depend upon the basics are identified for the economic area. After these tertiary industries which usually include the service and residentany activities are located and classified.

The key concept of this approach is that the basic industries are like the foundation of a building. They must be there in order to support the superstructures. This does not deny that the superstructure supports other portions of the superstructure. But it indicates that the whole edifice would tumble if the industries upon which the economy of the community is based should erode away.

Rather than transactions, income is used in this application of the Bureau of Reclamation study procedure. This choice is made because for the assigned counties inadequate data is available for a transaction based analysis while rather good income data can be - and was - obtained. The transaction data in census reports is not available for many industries in each of these small counties. The omissions are due to the census bureau practice of omitting data on any industry when the number of firms in an economic area is less than three, or if one firm is so large as to dominate the figures. However, employment information is usually available and valid wage and salary data can be obtained. Therefore the Bureau of Reclamation economic analysis technique based on personal income data is applicable and has been used.

After the incomes are computed for the counties, multipliers can be used derived in the manner described above. In the case of the eight-county study, however, it was not practicable to derive the income multipliers for the reason that in some of the counties so much of the income was derived from such sources as gambling, air force bases, or tourism, that it is almost impossible to determine the entire amount of the incomes derived from those activities, since industries of that type do not locate as basic industries but have their impact directly upon retail trade and the service industries. Complete information could not be secured without a rather complete survey and study using questionnaires in the community. Neither the resources nor the time permitted such an elaborate analysis to be made. What was done, therefore, was to derive income figures for the various industry groups within the county, similar to that which are reported by states in the Survey of Current Business. Insofar as multipliers were needed for the basic industries for analysis purposes, the multipliers derived from studies of other areas were applied to this study.

The considerations and the bases for the choice of the income multiplier of 2.5 are discussed in Chapter III, Section D, pages 98-99.

Method of Computing Net Personal Income

Net personal income consists of wages and salaries plus property income, less the personal contributions for unemployment insurance and old age benefits. Transfer payments are also included.

Agricultural net personal income determination was begun by computing the net livestock income and income from agriculture based on data from the 1964 Census of Agriculture (the latest date available).

Livestock incomes were determined by first obtaining the livestock products value added from the same Census of Agriculture. Then cash costs for all agricultural products were obtained. Because these omitted repairs, and taxes, a corresponding adjustment was made to the value added for these items. Depreciation is also omitted from the Census

cash costs, but no adjustment was made for this because of the wide variation between counties in this item. Data for the adjustments for repairs and taxes were obtained from cost studies from the University of Idaho State Experiment Stations and from the raw data from the W-79 Study. For these estimating purposes the size group of 150-300 animal units was used (an error of size would have a negligible influence on the factors used for repair and taxes). By this procedure, an adjusted net income excepting wages was obtained for all agriculture. This value was then divided between livestock and other agriculture in the proportion that each type bore to the total agriculture of the county. To the preceding two net income items were added the wages of hired labor for each from the Census of Agriculture to produce the total net incomes from livestock enterprises and other agriculture for each county.

For industrial, commercial, retail and related activities, income data on wages was secured form the various state employment offices.

The largest payroll items frequently omitted from the state employment data were for government activities. The procedure followed was to determine first how inclusive government income data were. When it was determined what was not included, the counties were then surveyed using telephone directories and Chamber of Commerce interviews to determine what government agencies were located in the counties. After this was determined, calls were made to the heads of these agencies in these counties, and they were asked to supply the wages and salaries paid out by that particular agency for the year 1964.

Employer income in businesses that were not incorporated had to be computed separately to arrive at estimates of the income of such self-employed individuals. Bankers of the community, and accountants, wherever possible, were interviewed, and from their comments estimates were made of the income of this group.

Independent professional people were also omitted from the state employment data. The telephone directory was consulted to determine the numbers of doctors, lawyers, certified public accountants, and other self-employed individuals, including insurance company agents, real estate brokers, and other self-employed service individuals. Again, accountants and bankers were consulted for salary estimates for each particular service or professional group.

In some communities, charitable institutions, churches, and other non-profit organizations were not included in the Public Employment Agency figures for wages and salaries. Again, telephone directories and city directories were consulted to determine what occupations of this nature were located in the survey counties.

In cases where the county had a hospital it was determined what the payrolls of these would be by consulting the superintendents of the hospitals and getting their estimates of the figures.

Schools and county payrolls were determined in most cases by consulting the school superintendents directly and by consulting the annual financial report of the county.

For the local community government the city clerk was consulted, and wherever possible, the city payrolls were examined to determine the wages and salaries from that source.

Property income was determined by taking the state total as reported by the U.S. Department of Commerce, Survey of Current Business, and computing the property income on the ratio that the income of the county bore to total income of the state exclusive of property income. Property income was thus distributed on a strictly income basis. It was assumed that for every dollar of income in the county the property income existed in the same proportion as it did for the state.

Transfer payments were distributed in exactly the same manner. Income payments plus property income less transfer payments were determined for each state, and the percentage of total income represented by transfer payments to total income of the state was distributed to the county in the same proportion as the income of the county was to the income of the state.

Figure VII-16

UNIVERSITY OF IDAHO FORAGE STUDY
FOR PUBLIC LAND LAW REVIEW COMMISSION

No._____
Date_____

PART II: 75 Ranch INTERVIEW

A. General Information

1. Present Privileges (Correlate to Part I & verify license — permits)

Agency	Unit	No. & Class	Season	AUM's

2. Ranch size (acres)

a. Non-Federal:

	Owned	Lease Private	Lease State
Range			
Irrigated Pasture			
Forage Crops			
Other Crops			
Timber			
Other			

b. Federal:

	(acres)	Description
BLM		
National Forest		

3. About what portion of the ranches in your neighborhood are still in the hands of the original owners or their heirs since 1934?

95%___ 90%___ 80%___ 65%___ 50%___ 30%___ 15%___ less than 15%___

4. Has Forest Service maximum limitation hampered your operation? No___ Yes___

If yes: What change would you make without the limitation?_____

B. History of Ranch

1. Acquisition

a. Is present ranch or portion of it in the hands of the original owner

of 1934 or in the hands of his heirs? No____Yes____
Percentage of present total AUM's ....._____%

b. Purchased _____ Inherited _____ Relationship _____

c. At acquisition were AUM's/No's. reduced/increased from that held by previous owner. No___Yes___Agency___Reduced___Increased___
Percent of total ....._____%

d. AUM's/No's. changed during your operation. No___Yes___
Agency____Reduced____Increased____Percent of total ..._____%

2. Have you since purchased additional licenses/permits. No___Yes____

a. Agency No.-Kind____AUM's, With: Land___Livestock____Value____
Non-use_____

b. How many times had these previously changed hands? _____
Comment:_____

c. Were AUM's/No's. reduced at time(s) of transfer? No___Yes___
How much_____%, time_____, and/or number_____

d. Transfer conditions by agency_____

e. Other_____

3. Ranch livestock after transfer:

Kind	Number	AUM's (total)
C & H		
S & G		

C. Reasons for Transfer

1. To enlarge _____
2. More base
3. Family _____
4. Inheritance
5. Reduced AUM's _____
6. Seller out of ranching
7. Seller not economic size _____
8. Other

D. Differential Grazing Costs

1. Price: Per AUM (latest purchase) or Per AU .....$_____

a. Included in price of land? No_____Yes_____
How much?_____

b. Included in price of animals? No_____Yes_____
How much?_____

c. Purchased separately?....._____

2. Rent private grazing land No____Yes____
Regularly _____ Intermittently _____
AUM price _____ AUM price _____

3. Comments on differences in the costs of grazing.

a. Costs of operation. Explain _____

b. Private lands used only as needed _____

c. Competition for use _____

d. Security of tenure _____

e. Productivity _____

f. Other _____

E. 1. a. What is the present value of this ranch? ....._____

b. What would the present value be if the federal land were owned instead of leased? ....._____

2. Real estate taxes: Do you believe your real estate taxes include any valuation for your federal grazing?
Yes_____No_____Don't know_____How much_____
Comment: _____

F. 1. Does your base ranch commensurability exceed minimum requirements?
Yes_____No_____ 25%_____50%____75%____100%____Over 100%_____

2. Have you had any difficulties in meeting commensurability requirements?
No____Yes____Explain _____

3. Has ranch been examined for commensurability? No___Yes___Year_____
4. Have requirements been changed since? No_____ Yes_____
   a. In what way? _____
   b. Were grazing privileges changed as a consequence? No_____ Yes_____
      Increase _____ Decrease _____
   c. If decreased, were privileges assigned to another? Describe _____
      Or was additional commensurability acquired. If so, how, purchase _____, private lease _____, state lease _____, other_____.
5. In the past ten years have there been any changes in livestock operation that effected base property commensurability? No_____Yes_____.

	Commensurability	Base
Kind change	Increase — Decrease	Sufficient Yes___No___
Type change	Increase — Decrease	Sufficient Yes___No___

   Explain _____
6. Has your base commensurability ever been challenged other than by adjudication? No_____Yes_____
   a. Agency _____
   b. Outcome (necessitate change in plans, etc.) _____
7. Have you ever abandoned plans to change your operation as to livestock and/or cropping because of the possible impairment of your ability to remain commensurate for your existing permit? No_____Yes_____
8. If you had no commensurability, or preference requirements, would you change your operation? No_____ Yes_____
   Explain with specifics? _____

G. BLM Allotment Management Plan
   1. Are you operating under a BLM Allotment Management Plan? No___Yes___ Year started_____.
   2. Has the AMP replaced either an Annual License or a Term Permit?
      a. Yes_____ No_____
      b. If not now, do you anticipate discontinuing the license (or permit)? No_____ Yes_____
      c. If so, when_____ and under what circumstances _____
   3. Was there to be a change in grazing privileges on this allotment if the AMP were not started? No_____, Increase___AUM's, Decrease___AUM's.
   4. Do you anticipate that the AMP will change the stability of your tenure on this allotment? No_____, Increase_____, Decrease_____.
   5. What changes were required in your grazing of the allotment as a result of the establishment of the AMP?
      a. AUM's increased_____ decreased _____ no change_____.
      b. Describe changes in management of stock _____
      c. Describe improvements and by whom financed _____
      d. Describe other changes and/or restrictions _____
   6. Has the BLM indicated that you may expect a change in grazing privileges on this allotment after a period of time?
      a. No_____ Yes_____ Not sure _____
      b. If so, Increase_____, Decrease _____, How much_____ AUM's in _____years.

H. FS Range Management Plan
   1. Are you operating under a Forest Service Range Management Plan or other _____? No_____ Yes_____ Year started_____.
   2. What are main features of plan? _____
   3. What is the effect on your operation (advantages and disadvantages)? _____

Figure VII-16, Continued

4. Has carrying capacity increased as result of plan? No____Yes____.
   How much? _____%
5. Have grazing privileges been changed?
   a. No____Yes____AUM's: Before_____Now_____.
   b. If increased, to whom were they granted? You_____, another_____.

I. Improvements (Separate sheet schedule).

I. IMPROVEMENTS

1. SCHEDULE OF IMPROVEMENTS MADE:

IMPROVEMENT TYPE		WHEN YEAR	USEABLE LIFE YEARS	FINANCE						FORAGE CHANGE	
				CASH		LABOR		EQUIPMENT		AVAIL-ABILITY	QUANTITY +, 0, -
				RANCH	GOVT.	RANCH	GOVT.	RANCH	GOVT.		
Brush-Weed Control	FS										
	BLM										
Fencing	FS										
	BLM										
Wells	FS										
	BLM										
Spring Development	FS										
	BLM										
Tanks & Reservoirs	FS										
	BLM										
Reseeding	FS										
	BLM										
Dams & Water Spreaders	FS										
	BLM										
Pipelines & Ditches	FS										
	BLM										

I. 2. a. What percentage of your investments have you recovered? _____%

b. What percentage do you expect to recover..... _____%

c. If you do not expect 100%, what is the reason? Problems with plan or operation _____, cancellation of grazing privileges ____, reduction of privileges _____, involuntary transfer of privileges ____, other___

Comments _____

3. If forage was increased, were more privileges granted?

a. No_____ Yes_____ Comments: _____

b. If no, had previous use been in excess of redetermined carrying capacity? No____Yes_____, or was non-use discontinued? No_____ Yes_____ other reason _____

4. a. What is your preference regarding the financing of improvements on the federal range? All federal_____, Joint____, All private_____, Some of each_____, No opinion_____.

b. Give reasons for above preference. _____

5. a. List improvements you proposed and agency reaction

Improvement	R.G.J.	Agency	(+ or -)	Reason Given

b. List improvements proposed by agency and your reaction

Improvement	Finan R.G.J.	Agency	Reaction (+ or -)	Reason Given

6. Are incentives used to encourage private and/or joint federal range improvements?

a. No_____ Yes_____ Examples _____

b. Would variable and incentive grazing fees induce you to make more range improvements? No_____Yes_____ Explain _____

c. Would greater assurance of the benefits of the improvement induce you to make more? No_____Yes____Comment_____

d. Would fair value compensation for improvements in the event of change in allocation or withdrawal of the land be an inducement? No_____Yes_____ Comment_____

e. Would adjusting the term of the lease to correspond somewhat to the degree of improvement be an inducement? No____Yes_____ Explain _____

7. What improvements have been made on the federal lands you graze to facilitate such other uses as: Hunting & fishing, wildlife preserves, other out-door recreation, watershed protection, etc.? Describe improvement, financing, and impact on grazing: _____

8. What is your position regarding private financing of other use improvements? Object strongly ____, Object Moderately ____, No Objection _____, Approve _____.

J. Interrelation with Other Uses of Federal Range

1. Indicate the impact of the following uses on the federal land you graze:

Use	Present	Impact*	Increase or Decrease (+, -, 0)
Timber production.....			
Mining (including gas & oil)			
Watershed management			
Water impoundments			
Soil conservation and stabilization			
Transmission right-of-way (power,gas,water)..			
Wildlife preservation			
Recreation			
Hunting birds			
Hunting large game			
Fishing			
Camping			
Hiking			
Rock Hounding			
Bikes & Jeeps			
Other			

* Use numbers: 1-None, 2-Compatible, 3-Slight limitation, 4-Moderate limitation, 5-Severely limits or excludes grazing

2. To what extent have your grazing privileges been changed to provide for any other land use?

Use (Same terms as 1)	AUM's Before	AUM's After	Year	Comments

3. Describe impacts classified as "4" and "5" intensity in #1 above.

_____

_____

_____

4. Do you feel that any particular use or activity(ies) is seriously threatening the grazing industry? If so, explain: _____

_____

5. Do you believe that any use or activity(ies) is inadequately emphasized at the present time? If so, explain: _____

_____

K. Advisory Boards

1. Have you ever served on an advisory board? No____Yes____FS____BLM____ Level _____ Years _____ _____
2. Have you ever presented a problem or suggestion to an advisory board? No____Yes____Level____Year____Problem or suggestion _____

_____

Action _____

_____

3. Of your fellow federal land grazers what proportion would you say are quite familiar with the functions of the advisory boards? About 100%____, 75%_____, 50%_____, 25%_____.
4. a. Are you in favor of each of the major multiple users in the area having a representative on the advisory board? Yes____No_____.
   b. If yes, should they be voting members? No____Yes____.
5. Give examples of changes you would recommend in advisory board operations and/or composition and the reasons for these changes.

_____

_____

_____

_____

Changing Ranching Organizations

1. Three new types of ranching operations have emerged in recent years. These are (1) the large corporation, (2) the out-of-state speculative purchasers, and (3) the FHA financed cooperative ranches. Please comment on whether any of these operations have influenced your ranching activities and in what way.

_____

_____

_____

Consolidation of Grazing Agencies

1. In your opinion how would ranching be influenced if all federal grazing land were administered by one agency? Improve____,Get worse____, no change _____, no opinion _____.
2. Further comments: _____

_____

_____

Ranchers Relationships with Others

How would you characterize the quality of the relationships with the following groups:

Group	Change in Last Five yrs.*	Present Quality of Relationships**
BLM		
FS		
Other Federal Agencies		
" " "		
General public		

*Use "+" for improvement, "-" for deterioration, "0" for no change.
**Use "1" for most favorable, "5" for least, 2,3,4, for graduations.

Financing

1. Do you have a mortgage on your land? No____Yes____ Federal Land Bank____, Insurance Co. _____, Seller _____, (other) _____.
2. When your Federal Land Bank mortgage(s) was arranged, what changes, if any, occurred in your grazing permits, licenses, and/or leases?
   a. Describe _____

   _____

   _____

   b. Did these include an extension of time? No____Yes____Years____Explain_

   _____

   _____

   _____

Figure VII-16, Continued

P. Outside income (Under 150 cattle or 750 sheep or equivalent)
1. Off ranch income _____% Rancher _____% Wife _____%
2. Outside income/work this area: Availability: (as good - fair - scarce)
a. Type _____ _____
_____ _____
_____ _____
b. Would work if available _____
c. Comment: _____
_____
_____

Q. Cooperative Grazing:
1. No. ____Association _____In Common_____
2. Describe operation: _____
_____
_____
a. Advantages _____
_____
b. Difficulties _____
_____
_____
3. Possible improvements:
a. Ranchers _____
_____
_____
b. Government _____
_____
_____

CHAPTER VIII

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ALTERNATIVE NO. 3

The Federal Government should administer its forage resources to obtain optimum returns in income for the Federal Government

A. Summary

The premise of this alternative recognizes the Federal Government as a landlord with the responsibility to obtain maximum income from the use of public lands.

B. Purpose

The purpose of this policy would be to secure maximum income from public lands.

C. Key Feature

Implementation of this policy would result in a system of charges based on market value of the resource. This could be ascertained by either appraisal or competitive bid. Base property requirements would be eliminated and preference provisions modified. Government investment in the range would be increased to the efficiency level. Constraints would be retained on grazing and other activities to assure preservation and improvement of the range land itself.

D. Probable Advantage

This policy would benefit the national public by assuring that the Federal Government would obtain maximum income from the user of the range. The taxpayer would, therefore, have a reduced burden in paying for administering public grazing lands.

E. Probable Disadvantage

Primarily this policy ignores the welfare aspects of land use.

ALTERNATIVE NO. 4

That the Federal Government optimize efficiency in administering forage resources on public lands.

A. and B. Summary and Purpose

Under this policy administration of public lands would be to obtain optimum efficiency at the administration level.

C. Key Feature

Administration of grazing resources by a single agency would eliminate duplication in agency administration, policies, and manpower. Disposal of isolated public lands would also be a part of this alternative. Local advisory boards would be utilized. Longer term leases or permits would be used by the government.

D. Probable Advantage

The efficiency factor of combining agency grazing administrations is not ascertainable and may not be substantial; however, it is anticipated that combining administration of the forage resources into a single agency would result in reduced administrative cost to the Federal Government. Range user would not be subjected to multiple forms, policies and practices between agencies.

E. Probable Disadvantage

Administration of forage resources by one agency and other resources by another agency could result in giving inadequate consideration to uses which are alternative to grazing. The tendency would be to reduce flexibility of use of the lands. Creation of a single agency to administer grazing would eliminate competing agencies against which each is judged.

ALTERNATIVE NO. 5

That the Federal Government administer forage resources on public lands to meet changing needs.

A. & B. Summary and Purpose

This alternative contemplates that the needs of society will change in the future and, therefore, public lands used for grazing should be administered to best meet future needs.

C. Key Feature

The key feature of this alternative would be retention of public lands used for grazing. The lands retained would be managed under a policy which anticipates change of use; therefore, security of tenure would not be increased, the privileges of grazing would not be converted to a right and methods of equitable adjustments when privileges are withdrawn would be established.

D. Probable Advantage

The national public would be assured that public lands now administered for grazing would be available for future needs. This would prevent costly procedures under eminent domain and eliminate the cost of repurchase of land from private users in order to put the land to a higher use.

E. Probable Disadvantage

Maintaining maximum flexibility of lands for future use by definition means minimum security of tenure for present users of the range land. The expected affects of minimal security of tenure would be reduced inclination to invest in the land or expand the range business. Compensation for range investment or privilege reduction when the public land is withdrawn from grazing use will not altogether alleviate this condition. An increased difficulty in financing is anticipated with the minimum security of tenure.

ALTERNATIVE NO. 6

That the Federal Government manage its grazing lands under a policy which assures maximum product control.

A. and B. Summary and Purpose

This policy is designed to attain product control over forage resources. The purpose is to assure proper balance of forage resources for future national needs and at the same time to restrict production of surpluses. Land obtained under land retirement programs may be used for forage while it is being withheld from production of agricultural products in surplus supply.

C. Key Feature

The most prominent feature of this policy is retention of public lands with forage resources. Transfer restrictions would be retained to assure that the Government maintain control over which permittees use the range. Land utilization lands would be retained to prevent their use for production of wheat or feed grains. No land would be transferred to the Bureau of Reclamation for irrigation, and no land that could be used for surplus crops would be homesteaded. If new land retention programs are instituted, the land thus retired would be used for grazing.

D. Probable Advantage

Since the institution of the farm program under the Triple A, the Federal Government has attempted to hold land out of production. The Soil Bank program was a recent attempt to accomplish the same result. At the same time that attempts were made to reduce production of surplus commodities, additional land under control of the Bureau of Land Management has been brought under irrigation and added to crop land thus increasing surpluses. This alternative would attempt to eliminate this inconsistency in policy. At the same time that surpluses are curtailed, livestock products which are not in surplus would be increased.

E. Probable Disadvantage

Regions which are not experiencing economic growth would be discriminated against in favor of the rapidly growing industrial areas. This would result in widening the gap between the industrial states and the rural states. It would increase economic

instability in the predominantly rural states. Should land retirement occur in large amounts, the rural communities would suffer severe economic depression.

SECTION B

ALTERNATIVE MANAGEMENT PRACTICES

Alternatives 7-19, inclusive, set forth a discussion of specific alternative practices. Discussed broadly under each alternative are the advantages and disadvantages.

ALTERNATIVE NO. 7

That the Federal Government increase the efficiency of allocation of grazing permits by removing the upper limits on grazing permits.

A. Summary

U.S. Forest Service permits are presently allocated with upper limit restrictions on quantity of AUM's which may be issued to operators. The system is designed to permit the maximum number of people to participate in use of the public rangelands. Under this alternative these upper limit restrictions would be eliminated.

B. Purpose

The objective of this alternative is to secure efficient size operations to assure optimum production of forage resources and lower meat prices.

C. Key Feature

The upper limits on U.S. Forest Service permits would be eliminated.

D. Probable Advantage

Development of the public land would be advanced by optimizing the efficiency of use of the lands. The national public would benefit from this alternative.

E. Probable Disadvantage

This system would have the effect of reducing the efficiency of the smaller permittee or livestock operator. The probable result

would be that an unknown number of these operators would be forced out of business.

In addition to creating this disadvantage, there would be some adverse effect on rural communities dependent upon the livestock industry.

VARIATION(S) TO ALTERNATIVE NO. 7

VARIATION NO. 7A

A. Summary

That the Bureau of Land Management and the U.S. Forest Service establish lower limits on those to whom they issue grazing permits.

This variation would require that the Bureau of Land Management and the U.S. Forest Service establish lower limits below which economic units cannot operate and issue grazing permits only to permittees whose operations exceed the lower limits. The objective of this variation is to eliminate inefficient operations.

B. Distinctive Characteristic or Effect

This variation complements the policy of issuing permits to larger permittees. The effects would be similar; however, under this policy smaller units would be directly affected at the outset of the program. This system would most directly affect areas in the Southwest where small operators are predominant.

To implement this variation there would have to be adjustments in the rules of "priority" in issuing permits. Limiting the size of operations would decrease or completely eliminate issuance of permits to persons only "incidentally" in the livestock business.

VARIATION NO. 7B

A. Summary

That the Bureau of Land Management and the U.S. Forest Service increase efficiency of allocation of grazing permits by removing the commensurability and dependency requirements.

Present permits of the U.S. Forest Service and the Bureau of Land Management are issued to permittees who can maintain livestock

on base property for a specified portion of the year. This requirement is the "commensurability" provision of both the Bureau of Land Management and the U.S. Forest Service and is designed to assure that the permittee uses the Federal range to round out a properly balanced year-long livestock operation. Base property must be dependent upon the public land to round out a year around operation. Before grazing privileges may be transferred or waived, the transferee must be able to satisfy the commensurability and dependency requirements. This variation is designed to remove these transfer restrictions.

B. Distinctive Characteristic or Effect

Removal of these transfer restrictions would facilitate freer transfer of grazing permits within the industry. With no commensurability or dependency requirements, permittees could enlarge their operation without obtaining additional base property. Removal of commensurability and dependency requirements would, therefore, tend to make more efficient operations on the range.

Implementing this practice would necessitate changing the policy that the public lands should be used to round out a year-round operation. This practice would tend to cause some disruption to local economies.

ALTERNATIVE NO. 8

That the Bureau of Land Management and U.S. Forest Service increase the security of tenure on public rangelands by increasing the length of grazing permits, or leases to twenty (20) years.

A. Summary

Grazing permits are issued on Bureau of Land Management grazing districts and U.S. Forest Service lands for a term not to exceed ten (10) years. Under this alternative permits would be issued for a term of twenty (20) years.

B. Purpose

The purpose of extending permits from ten (10) years to twenty (20) years (or greater) is to secure additional security of tenure for the permittee.

C. Key Feature

Grazing permits would be issued for periods up to twenty (20) years.

D. Probable Advantage

An increase in the length of grazing permits from ten (10) to twenty (20) years would give the permittee a greater feeling of security. The permittee would feel less reluctant to finance long range improvements on the public lands. It is anticipated that, to some degree, this procedure would facilitate the permittee in securing assistance in financing range improvements.

E. Probable Disadvantage

Both the Bureau of Land Management and the U.S. Forest Service provide that permits are subject to cancellation or reduction for violation of the rules and regulations governing the permit, for violation of the terms of the permit and in case of reclassification of the land to a higher use. Deterioration of the range may cause reduction of the permits. With these provisions remaining applicable, the fact that the permit is issued for a period of ten (10) years or twenty (20) years is not significant from the standpoint of authority of the agencies to reduce or cancel the permit. A permittee is given a preference right or

priority of renewal of the ten (10) year permit. In view of these two facts the extension of term of permit does not significantly change the basic tenure of the permittee.

VARIATION(S) TO ALTERNATIVE NO. 8

VARIATION NO. 8-A

A. Summary

That the Federal Government issue permits on public lands for terms of ten (10) years with the provision that after five (5) years the permit be extended an additional five (5) years.

This variation is designed to establish a "revolving ten (10) year permit" which is extended every five (5) years for a period of five (5) years. The objective of this system is to establish a permit which is never reduced below a five year term.

B. Distinctive Characteristic or Effect

By establishing this system of issuing permits the security of tenure of the permit would be increased to the extent that the permit to graze livestock would never be reduced below five (5) years. With this permit it would be anticipated that permittees would increase development of the land and investment in the livestock business.

The system would cause additional administrative costs to administer and, as with the twenty (20) year permit, would not secure additional security against reduction or cancellation for violation of either rules, regulations, or terms of the permit, for range deterioration or withdrawal of the land.

VARIATION NO. 8-B

A. Summary

That the Bureau of Land Management and the U.S. Forest Service issue permits to graze a number of AUM's in perpetuity.

Under this variation the Bureau of Land Management and the U.S. Forest Service would issue permits which grant the right to graze a number of AUM's on the rangeland in perpetuity. The agencies would reserve the authority to reduce the grazing

quantity from year to year. Each reduction, however, would necessitate compensation by the Government.

B. Distinctive Characteristic or Effect

The cost to the government would be increased and administrative flexibility to manage the land for multiple purposes would be decreased.

Investment in the public lands by the permittee would be substantially higher under this alternative policy because of the increase in security of tenure.

ALTERNATIVE NO. 9

That additional range capacity resulting from management or range improvements on public land be allocated to the existing permit holders.

A. & C. Summary and Key Feature

Increases in grazing capacity are presently apportioned with the objective of stabilization of livestock operations controlling qualified base property with emphasis being given to restoration of reductions that have been imposed to reach the grazing capacity of the particular range. Under this alternative increases in grazing capacity would be allocated to existing permit holders without an objective of restoring previous cuts.

B. Purpose

The objective of this alternative is to allocate all increases proportionately among permittees.

D. Probable Advantage

This system would work to the advantage of permit holders who have not received past reductions in grazing capacities. They would be assured of the right to share in increased grazing capacity.

E. Probable Disadvantage

This system would not provide an incentive for investment in the land or good range management. Those who suffer reductions would not receive preference in allocation of additional grazing capacity. As a consequence security of tenure and investment would be reduced.

VARIATION(S) TO ALTERNATIVE NO. 9

VARIATION NO. 9-A

A. Summary

That additional range capacity resulting from management or range improvement be allocated among present permit holders in proportion to their investment and responsibility for the increase

with additional capacity resulting from public investment being allocated other qualified users.

B. Distinctive Characteristics or Effect

This variation contributes major incentives for contributions in range improvements and good range management.

VARIATION NO. 9-B

A. Summary

That Class I (Bureau of Land Management) users have priority in the allocation of increased grazing capacity of the public land to the extent they are able to increase the capacities of their base property.

B. Distinctive Characteristics or Effect

The effect of this variation would be to tie increased capacity to those permittees who were established as dependent by use during the priority period. A benefit would accrue to these users because of historical use. The livestock industry would be further stabilized. This variation would not provide non Class I users with incentives to improve the range capacity; nor would it reward non Class I users who, in fact, have improved the capacity of the range. The system would provide additional benefits to permittees based solely on historic use and dependency without consideration to their management or investment practices.

ALTERNATIVE NO. 10

That the Federal Government compensate range users for the value of range privileges where range privileges are reduced or eliminated.

A. Summary

This proposal would in effect convert the existing system of use of the federal range from a "privilege" to a "right." Before the Federal Government could reduce or eliminate grazing use for any reason, whether resulting from withdrawal, exchange or deterioration of the range land, or other, the user would be entitled to compensation for loss of use of the land.

B. Purpose

The primary purpose of converting a grazing "privilege" to a "right" would be to increase the security of tenure and investment of the range user.

C. Key Feature

Issuance of a permit to use the public range would constitute granting of a valuable property interest to the range user.

D. Probable Advantage

The primary advantage would be increased security to the user of the range. The result of increased security would be a correlated increase in ability to secure financing for investment purposes and a probable increased investment in the livestock business by permittees. Better care and preservation of the range lands would be anticipated.

E. Probable Disadvantage

By granting a property interest in public lands to a single purpose user, management of the land would become less flexible and more difficult to manage for multipurpose. The increased cost to the Federal Government is not ascertainable but would be substantial. Also, to be considered is the equity of granting rights to a particular class of users of the lands while other users are not given the same status. Inherent in this alternative is a recognition that expected continuation of grazing privileges has been capitalized into the value of the base property. It would be contrary to the disclaimer of present policy that a permit does not confer any interest in the property itself.

VARIATION (S) TO ALTERNATIVE NO. 10

VARIATION NO. 10-A

A. Summary

That the Federal Government compensate the permittee for value of the permit only when the reduction or cancellation was caused by no action of the permittee. This reduction or cancellation would result when the land was reclassified for another use, or withdrawn or exchanged by the Government.

B. Distinctive Characteristic or Effect

The Government retains the authority to reduce or cancel the grazing permit for a number of reasons. Included therein is loss of base property requirements, changes in grazing capacity, adjustments because of errors or noncompliance with rules, regulations or terms and conditions of the permit or license. Under this alternative compensation for loss of privilege would not be made if the permit were reduced or canceled for any of these reasons.

In addition to the effects of Alternative 10, this variation would provide incentive in the permittee to maintain the federal range and not violate the terms or conditions of the permit or license. The theory of this variation is that the permittee should not be compensated for the value of his privilege when his loss was caused by his own actions. This variation does not provide the degree of security presented by Alternative 10. It is anticipated that this variation would cause additional administrative complications and expense in adjusting permits and in verifying noncompliance.

ALTERNATIVE NO. 11

That range users be compensated for range improvements where range privileges are reduced or eliminated.

A. Summary

This proposal provides for payment to land users for the value of their contribution to improvement of the federal range at any time their use of the public range is reduced. The proposal implicitly recognizes that many valuable range improvements have been placed on public lands by range users.

B. Purpose

This proposal is designed to assure the investor in public lands a return on his investment.

C. Key Feature

The important feature of this proposal is its comprehensive application. Compensation would be made for partial loss of value of improvements due to partial loss of grazing privileges.

D. Probable Advantage

By assuring the range user that he will be compensated for any loss of value of investment in range improvements caused by reduction or elimination of the grazing privilege, the security of investment will be maximized. With security of investment maximized the probable investment of the range user will be maximized. This will contribute to improvement and development of public lands.

E. Probable Disadvantage

Computing the loss of value of a range improvement caused by partial loss of grazing privileges is nearly impossible. There would be additional expense to the Government.

VARIATION(S) TO ALTERNATIVE NO. 11

VARIATION NO. 11-A

A. Summary

That range users be compensated for range improvements where land is taken to be devoted to federal nonmilitary use.

Taking for military use is excluded from the scope of this variation because of the Act of July 9, 1942 (43 U.S.C.A. 315q) under which grazing licensees or permittees are compensated for the losses sustained by reason of cancellation of or prevention of use of authorized grazing privileges resulting from the use of the lands, embraced in the licenses or permits, for war or national defense purposes.

At present, individuals who appropriate federal range are required to reimburse the permittee for his contribution to the cost of range improvements at its current value.

B. Distinctive Characteristic or Effect

Compensation for range improvements is intended to encompass all situations in which a federal department or agency requires the use of any federal land for use other than war and national defense purposes; however, this variation does not contemplate compensation for range improvement at the time the privilege is reduced rather than cancelled. The effect would be substantially similar as relates to Alternative 11, but would not create the administrative task of evaluating a loss caused by partial reduction of grazing use.

VARIATION NO. 11-B

A. Summary

That the Federal Government compensate for range improvement on the residual value basis. This variation is designed to assure the permittee that his range improvements will not be amortized over a period of years but that he will realize compensation for the full residual value of the investment at any time that he loses the improvement.

B. Distinctive Characteristic or Effect

This method of determining the value of range improvement is distinguished from the amortization or depreciation method. The advantage of this system would be to encourage continuous repair and replacement of the investment. It will secure better management of the range as a result of upkeep of the improvement.

This system would be difficult to administer because of the increased complications of determining residual value. A greater expense to the Government would be anticipated.

VARIATION NO. 11-C

A. Summary

That the Federal Government create a special fund in the U.S. Treasury out of a special annual charge to be collected from grazing permittees, from which compensation would be made as indemnity for loss in value of base property as a result of reducing or eliminating the grazing privilege. This indemnity would be for compensation for either loss of investment in range improvement or loss of privilege.

B. Distinctive Characteristic or Effect

Rather than requiring the Federal Government to appropriate funds for purpose of compensation, the permittees themselves would be assessed an amount fixed as a percentage of the public land grazing use charge he pays. The indemnity would operate on principals of insurance. The additional cost would not fall upon the Government and the concept that the Government grants no interest in the land would be maintained. The permittee would realize a greater charge for use of the range.

ALTERNATIVE NO. 12

That the Federal Government make all range improvements on the public rangelands.

A. Summary

At present both the permittee and Federal Government make range improvements on the public rangelands. Permittee improvements must, however, be authorized. Under this alternative all investments would be by the Federal Government.

B. Purpose

This alternative is designed to eliminate the inequities created by allowing the permittee to make improvements on the range and subsequently appropriating the land upon which the improvements were made with no compensation to the permittee. An additional purpose would be to obtain maximum control over range improvements to assure multipurpose management.

C. Key Feature

All range improvements would be at the cost and direction of the Federal Government. The permittee would make no range improvements.

D. Probable Advantage

The permittee would never suffer a loss of investment because of subsequent appropriation of the land and the Federal Government would have fewer equitable restrictions in managing the rangeland. The feeling of a proprietary interest in the permittee would be reduced.

E. Probable Disadvantage

Financing all range improvements would create an additional substantial federal expense in administering the rangelands. It would be anticipated that with the additional expense to the Federal Government, fewer range improvements would be made on the land. The permittee would lose a part of his management control over the lands upon which he grazes livestock. Management of the lands would tend to a greater extent to be centered in administrative offices removed from the land itself.

VARIATION(S) TO ALTERNATIVE NO. 12

VARIATION NO. 12-A

A. Summary

That the Federal Government make all long-term range improvements, such as fences, wells, and other water developments. These may be categorized as physical or structural improvements. The permittee would make all non-structural range improvements, such as seeding, plant control, water spreading, burning, etc.

B. Distinctive Characteristics or Effect

The purpose of this variation is to provide that the shorter term improvements which will realize quicker returns to the permittee be made by the permittee; investments which are of longer term significance would be made by the Federal Government. The distinctive characteristic of this variation is that the Federal Government would make only structural improvements on the public rangelands.

The primary advantage of this variation would be that the permittee would not be required or authorized to make range improvements when his chances of recoupment are low. The Government would have greater flexibility in use of the lands because of fewer equitable considerations at time of withdrawal or cancellation of the privilege. The permittee would not have the proprietary interest in the land which long-term investments engender.

Without additional assurance that cancellation of the privilege will be accompanied by compensation for all range improvement investments, the permittee will still lose the value of his investment at the time of cancellation.

Additional costs to the Federal Government may result in fewer range improvements and a reduced progress of rangeland development.

VARIATION NO. 12-B

A. Summary

That all range improvements be made by the permittee. The objective is to give the greatest amount of control in managing public lands to those who use the land. Range improvement fees would be eliminated.

B. Distinctive Characteristic or Effect

By requiring the permittee to make all range improvements on public rangelands, the land would be developed to optimize production of forage resources.

Without additional security, the permittee would be reluctant to make long-term range improvements. The land would be developed primarily to optimize forage production at the expense of alternate uses of the land. The permittee would develop a proprietary interest in the land which would create additional complications for the Government in managing the land for multiple uses.

The permittees would be reluctant or unable to implement needed expensive range improvements. The result would be that in many cases needed long-range improvements would not be constructed on public lands.

VARIATION NO. 12-C

A. Summary

That the Federal Government provide an added incentive to range permittees to make authorized range improvements by giving the permittee a credit in the form of reduced grazing fees equal in amount to the value of such contribution.

B. Distinctive Characteristic or Effect

This variation contemplates that the range user will make contributions toward improvement of the public range. The Federal Government, under this policy, would encourage these contributions.

By reducing fees up to an amount equal to the value of all permittee contributions to range improvements, range permittees would make greater investments in the public lands. The cash payment of fees would be reduced and the permittee would have a greater amount of operating capital.

However, the system would reduce the revenues received by the Federal Government in the form of fees. Local governments would, therefore, realize less revenue sharing funds. Anticipated grazing fee revenue would be more difficult to project. Administration costs would be increased to manage this system.

VARIATION NO. 12-D

A. Summary

That the range improvements portion of the grazing fee be increased on Bureau of Land Management lands to fifty (50) percentum.

At present thirty-three (33) percentum of all fees collected on grazing district lands and twenty-five (25) percentum of all fees collected on Section 15 lands are made available for range improvements. Under this variation the amount would be increased to fifty (50) percentum.

B. Distinctive Characteristic or Effect

Under this variation both the Government and permittee would continue to make range improvements. There would, however, be an increase in moneys available for range improvement. The effect that this increased emphasis on range improvement would have on forage production is unknown.

VARIATION NO. 12-E

A. Summary

That the Federal Government adjust the length of permits to conform to the expected length of life of improvements in which permittees participate.

At present, the Bureau of Land Management and the U.S. Forest Service permits are issued for a maximum term of ten (10) years. In setting term of permit no consideration is given to expected life of range improvement contributions made by the permittee. Under this variation the terms of the permits would be established and adjusted to conform to the expected life of range improvement contributions. The purpose of this variation is to increase the security of investment of the permittee who contributes to range improvements.

B. Distinctive Characteristic or Effect

By altering the length of permits to conform to the expected life of range improvement contribution, the Federal Government would create the impression that the permit would not be effected

during the life of the investment. However, the permit would remain subject to reduction or cancellation during this period. The effect would be an appearance of increased security of tenure during the life of the range improvement while, in fact, no significant legal increase in security of tenure would be created.

ALTERNATIVE NO. 13

That the Federal Government dispose of public grazing land by sale to the highest bidder.

A. Summary

This alternative is set forth to analyze the effects that sale of public grazing lands would have on range users and the livestock industry. Sale of the public lands would be to the highest bidder.

B. Purpose

The purpose of selling the public lands to the highest bidder would be to realize the maximum revenue from disposal of the lands.

C. Key Feature

Disposal of the lands would be to the highest bidder.

D. Probable Advantage

The advantage of this alternative would be that the national public and Federal Government would realize maximum revenue from sale of the land. By selling to the highest bidder, no single group or interest would be favored over another. By acquiring public lands the optimum security would be achieved by the user and the owner would then manage the land to optimize forage production.

E. Probable Disadvantage

Sale of public grazing lands to highest bidder would tend to greater instability in range industry. This system would work to the disadvantage of local economies. This effect would be caused because of the inability of smaller operators to purchase the lands at the price a competitive bid would produce.

VARIATION(S) TO ALTERNATIVE NO. 13

VARIATION NO. 13-A

A. Summary

That the Federal Government dispose of public grazing lands by sale at appraised market value giving the permittee using the land first option to purchase the land.

B. Distinctive Characteristics or Effect

The Government would realize a fair return from the sale of the land and at the same time the permittee would be given an opportunity to purchase the land at a fair market value. This would tend to cause less disruption to the livestock industry than selling the land at highest bid.

VARIATION NO. 13-B

A. Summary

That public grazing lands be sold at a value based upon their range productivity only. This value would be established by appraisal with first option to permittee to purchase land.

This alternative is designed to assure permittees an opportunity to purchase public lands upon which they graze livestock at a value commensurate with the value which the lands have to the permittee.

B. Distinctive Characteristics or Effect

The effect of this alternative would be to reduce the disruptive effect to the livestock industry of a general public sale of grazing lands. The permittees would benefit by assurance that they could purchase the lands at a price commensurate to the value of the land to them.

This alternative would provide a windfall to permittees to the extent the speculative value of the lands is in excess of the productivity value.

VARIATION NO. 13-C

A. Summary

That the Government retain the hunting and fishing rights on the lands for the general public.

Under this alternative, any public grazing lands sold by the Government would be sold subject to the condition that the public have access for hunting and fishing purposes.

B. Distinctive Characteristics or Effect

This alternative would be designed to maintain in part the multiple use of the land after disposal to the public.

ALTERNATIVE NO. 14

That the Federal Government combine the administration of all forage and grazing activities of the Bureau of Land Management and U.S. Forest Service into one agency.

A. Summary

The U.S. Forest Service and the Bureau of Land Management manage substantially all grazing on public lands. Under this alternative, administration of the grazing lands of both agencies would be combined into one agency.

B. Purpose

The purpose of this alternative would be to increase the efficiency of managing forage resources and to standardize procedures of administration.

C. Key Feature

The Bureau of Land Management and U.S. Forest Service would use standardized procedures for administration of forage resources.

D. Probable Advantage

It is anticipated that this alternative would result in greater efficiency of administration of forage resources. This alternative would benefit the permittee by reducing administrative inconsistencies between agencies.

E. Probable Disadvantages

Giving one agency jurisdiction over administering forage resources on Bureau of Land Management and U.S. Forest Service land without transferring administration of other resources to that agency could result in management of the land with inadequate consideration of alternate uses of the land. Flexibility of use of the land would be decreased.

VARIATION(S) TO ALTERNATIVE NO. 14

VARIATION NO. 14-A

A. Summary

That the Bureau of Land Management administer Section 15 lands under the same regulations as grazing district lands. This alternative is designed to improve efficiency of administration.

B. Distinctive Characteristics or Effect

The dual advantage of administering both grazing district lands and Section 15 lands under the same regulation would be to the permittee and Federal Government. The permittee would not be subjected to two different administrative systems and the Government would operate at a greater efficiency.

ALTERNATIVE NO. 15

That grazing permits should not be revoked for violation of rules and regulations or terms of the permit.

A. & C. Summary and Key Feature

Under existing regulations, permits may be reduced or revoked for violation of rules and regulations governing the permits or for violation of the terms of the permit. Under this alternative, no reduction in use or revocation would be administered for these reasons.

B. Purpose

The purpose of this objective is to increase the security of tenure of the permittee by reducing the grounds upon which the permit may be reduced or revoked.

D. Probable Advantage

The permittee would be able to operate with security against administrative action against his permit for violation of the terms of his permit or the regulations governing the permit. The permittee would not be exposed to the expense of administrative and court action to prove his innocence in mistaken administrative actions.

E. Probable Disadvantage

The Government would lose substantial control over administration of the range.

ALTERNATIVE NO. 16

That the Government purchase all permits at the fair market value prior to implementing any reallocation of permits or alteration of the present system.

A. & C. Summary and Key Feature

Under the present system of allocation and fee charges a value has been capitalized into the value of existing permits. Many alternatives which could be implemented would have the effect of removing this value causing existing permittees wealth loss. Under this alternative the Government would purchase all permits at the present fair market value and then establish alternative policies.

B. Purpose

The purpose of this action would be to prevent a wealth loss to existing permittees because of a new system of administering grazing.

D. Probable Advantages

The permittees who recently purchased permits under the present system in which value is capitalized into permits would be compensated for the investment. Without this compensation an unknown number of permittees would suffer irreparable damage.

E. Probable Disadvantage

Inherent in this alternative is the concept that a permit is a property right -- a concept which is contrary to congressional and administrative policy. Determining the value of the permit would be difficult and compensation would be costly.

ALTERNATIVE NO. 17

That the composition of advisory boards be expanded to assure representation of various multiple use interests.

A. & C. Summary and Key Feature

At present, advisory boards are composed of various classes of stockmen and one wildlife representative. Under this alternative the board would be expanded to include other multiple interests, including recreation representatives.

B. Purpose

The purpose of this alternative is to give additional authority to multiple use interests in managing public grazing lands.

D. Probable Advantage

The most probable advantage of this alternative would be in broadening the interests which make recommendation of policy in administering public rangelands.

E. Probable Disadvantage

By granting wider interest groups representation on the advisory boards, the power of the stockmen would be reduced. The advisory boards system would tend to lose the support of stockmen and permittees.

VARIATION(S) TO ALTERNATIVE NO. 17

VARIATION NO. 17-A

A. Summary

That the authority of the advisory boards be increased to the decision making level.

B. Distinctive Characteristics or Effect

Under this variation the composition of the advisory boards

would be given authority to make decisions rather than simply advise or make recommendation in all matters relating to administration of the Federal Range Code.

The primary advantage of this system would be in giving those who use the land authority to manage it. Security of tenure and investment would be enhanced.

The primary disadvantage to this system would be to programs relating to multiple use of the rangelands. Allowing one user of the public land authority over management of the land would create built in inflexibility for alternative uses.

VARIATION NO. 17-B

A. Summary

That the management of all grazing lands be by locally organized supervising boards. Under this system local boards would be given authority over all management decisions relating to public rangelands in that locality.

B. Distinctive Characteristics or Effect

Under this system rangelands would be managed with the interests of the locality in mind. The benefits would be to the local areas.

There would be discrepancy in administration between regions under this system. The national multiple purpose administration would not be recognized to the extent that it is under government department and agency administration.

ALTERNATIVE NO. 18

That statutory guidelines which set standards for for wildlife development and utilization of forage resources on public grazing lands be established.

A. & C. Summary and Key Feature

Present statutes do not provide criteria or guidelines for allocating forage resources between wildlife and livestock. This alternative provides that these guidelines be established.

B. Purpose

The purpose of establishing congressional guidelines for allocating forage resources between wildlife and domestic livestock is to assure wildlife adequate feed.

D. Probable Advantage

A uniform policy would be established which would be followed by all agencies in allocating forage resources between wildlife and domestic livestock. Agencies administering grazing lands have not established criteria for this allocation. By providing statutory guidelines the wildlife would be assured of forage resource allocation on all public lands.

ALTERNATIVE NO. 19

That statutory guidelines by which agencies are to set fee levels be established.

A. & C. Summary and Key Feature

Existing statutes do not provide clear guidelines by which agencies are to set grazing fees. As a result the agencies are subject to pressures to adjust fee charges and the permittees are subjected to the insecurity of possible future changes in fees. Under this alternative guidelines would be established by statute.

B. Purpose

The purpose of establishing statutory guidelines for fee charges is to provide additional security for the permittee.

D. Probable Advantage

Administrative agencies will be subjected to less influences to alter fee charges if clear guidelines are expressed in the statutes. Permittees will realize greater security.

E. Probable Disadvantage

Changing future needs and policies may require different fee charges. If the present policies are clearly set forth by statute it will be difficult to obtain congressional action to change the policies to meet these future needs.

VARIATION(S) TO ALTERNATIVE NO. 19

VARIATION NO. 19-A

A. Summary

That the federal agencies establish a rate of charge for grazing on rangelands by competitive bid. This would give the Government full rental value of the rangeland.

This variation is designed to maximize income return to the Government and to remove advantages given to prior or present users of the range. Commensurability and base property requirements would be eliminated together with priority of use preferences in allocation. Right of renewal of permits would also be eliminated.

B. Distinctive Characteristic or Effect

The primary advantage would be in increased income to the Federal Government. Greater justice to non-permittees would be achieved. The tendency of this system would be toward allocation of range resources to permittees who are able to make best economic use of the rangeland. Revenues from revenue sharing will be increased to local governments.

Present range users would lose the economic value capitalized into grazing permits under the present system. This system would reduce security of tenure and investment. The result would be reduced future investments in the range by permittees. Communities dependent upon livestock industry would be disrupted by adverse effects on small operators.

There would be considerable disruption to the present system of group grazing in the U.S. Forest Service and the Bureau of Land Management.

VARIATION NO. 19-B

A. Summary

That the Federal Government set fees by competitive bid, giving permittee preference right to meet highest bid. (Montana System)

B. Distinctive Characteristic or Effect

This variation gives limited preference of renewal to permittee. As a consequence the permittee would retain in part the security of tenure which the present preference right of renewal provides.

VARIATION NO. 19-C

A. Summary

That the Bureau of Land Management and the U.S. Forest Service establish a fee based upon the difference between the value of forage on private land and that of public land after adjusting additional costs attributable to public land grazing.

B. Distinctive Characteristic or Effect

This system of charge would not adversely affect security of either tenure or investment. However, the capitalized value of the

permit to present permittees would be eliminated. The result to present users would be a higher fee charge. Smaller and marginal operations would become inefficient operations.

The Government would be charging a fee based upon actual value of resource and no disparagement would exist between permittees and non-permittees.

This system would be costly to administer by the Government.

VARIATION NO. 19-D

A. Summary

That the Bureau of Land Management and the U.S. Forest Service establish a fee based upon the value of forage on private land and that of public land after adjusting additional costs attributable to public land grazing. One of these costs would be the interest charge on market value of the permit.

B. Distinctive Characteristic or Effect

This system recognizes as a cost the value of the privilege at time of transfer. As a result of including the interest cost of the value of the permit at time of previous transfers, the current fee rate is frozen at its current level. As a consequence this system would transfer to present holders of permits the full property value of grazing on the public range at current fee levels.

VARIATION NO. 19-E

A. Summary

That the Bureau of Land Management and the U.S. Forest Service establish a formula whereby the current fee base and the interest on the current permit value is recognized, but future fees are varied with increases or decreases in the value productivity of the range land.

B. Distinctive Characteristic or Effect

This system recognizes the present permit value but permits the Government to capture future capital gains originating from public grazing lands.

Present permittees would benefit from recognition of the permit value. Permittees who recently acquired permits will be assured that they will not lose the capitalized value of the permit.

This system recognizes that current permittees have a property right in the public land. This recognition is contrary to expressed policy of both the Bureau of Land Management and the U.S. Forest Service.

VARIATION NO. 19-F

A. Summary

That grazing fees be based upon cost of administration of the land. Under this variation fees would be varied to cover cost of administration. The purpose of this system would be to make all resource programs of the Government self-sustaining.

B. Distinctive Characteristic or Effect

Under this program the Government would benefit by assurance that no general funds would be used to administer rangelands.

This policy would cause pressure to reduce administration below level necessary for efficient management. By charging the range permittee the cost of administering rangelands, nonpaying multiple users will receive a benefit at the expense of the permittee. Many multiple uses create non-market benefits.

VARIATION NO. 19-G

A. Summary

That the Bureau of Land Management and the U.S. Forest Service charge a fee based upon appraisal of the land.

B. Distinctive Characteristic or Effect

This system will assure the Federal Government a fair fee return from the land. Security of tenure will not be decreased because, unlike competitive bid, present preference right of renewal can be retained.

This system would be costly to administer.

VARIATION NO. 19-H

A. Summary

That the grazing fees be based upon a set minimum and maximum fee. Within each range and taking into account the variable factors of kind of forage, degree of range improvement, dependability of the range, and average price of livestock for the preceding year, the range manager would establish the exact fee.

B. Distinctive Characteristic or Effect

Under this system the permittee would be benefited to the extent that the fee charged would take into consideration specific factors relating to the range allocated to him. Additional security will be realized by establishing fixed limits above which the fee cannot be established.

The system would be costly to administer.

VARIATION NO. 19-I

A. Summary

That the system of charge on public rangelands be based upon a recognized and accepted basis of animal unit equivalents.

B. Distinctive Characteristic or Effect

There would be some increase in cost of administering this system.

However, it would create greater equality between different operations on the range. At present, the cow-calf operations are benefited by the free use of animals under six months of age.

VARIATION NO. 19-J

A. Summary

That fees be charged on a uniform basis by all governmental agencies.

B. Distinctive Characteristic or Effect

Agencies charge fees based upon their objectives and methods of allocation. To require all agencies to charge fees based upon the same system would also require alteration of basic agency objectives and methods of allocation.

VARIATION NO. 19-K

A. Summary

That the Department of the Interior fix a maximum and minimum fee allowing the local grazing district advisory boards to recommend an adjustment of fees within this range based upon individual circumstances. The local districts would retain the amounts collected above the minimum and use them for range improvements within that district.

B. Distinctive Characteristic or Effect

The range lands would be benefited by additional range improvement programs under this variation.

There would be less uniformity of fees charged by giving district advisory boards the authority to make recommended adjustments within the districts. The Bureau of Land Management would lose some control over allocation of range improvement fees.

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Digest of Public Land Laws. Prepared by Shepard's Citations, Inc., of Colorado Springs, Colorado. 1968. $6.50

History of Public Land Law Development. Written by Professors Paul Wallace Gates of Cornell University and Robert W. Swenson of the University of Utah. 1968. $8.25

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Clearinghouse prices for these reports are based upon the number of volumes into which each report is divided, indicated for each report in the following listing. Price: $3.00 per volume for paper printouts; $0.65 per volume for microfiche.

Federal Legislative Jurisdiction. Prepared by the Land and Natural Resources Division, United States Department of Justice. Revised September 1969. One volume. Order number P B 185 920.

Study of Withdrawals and Reservations of Public Domain Lands. Prepared by Charles F. Wheatley, Jr. Revised September, 1969. Order numbers: P B 187 002, P B 187 003, P B 187 004.

Administrative Procedures and the Public Lands. Prepared by The University of Virginia, School of Law. Revised September, 1969. One volume. Order number: P B 187 205.

Fish and Wildlife Resources on the Public Lands. Prepared by the Department of Fish and Wildlife Biology, Colorado State University. Revised September, 1969. Two volumes. Order number: P B 187 246, P B 187 247.

Public Land Timber Policy. By George Banshaf & Company, Milwaukee, Wisconsin. Revised October 1969. Published in four volumes, Nos. PB 187 728, BP 187 729, PB 187 730, PB 187 731.

Federal Public Land Laws and Policies Relating to Intensive Agriculture. Resources portion by South Dakota State University. Legal portion by Kronick, Moskovitz, Tiedemann & Girard, Sacramento, California. Revised October 1969. Published in four volumes. Legal portion, Volume I, No. PB 188 061; resources portion, Volumes II, III, and IV, Nos. PB 188 062, PB 188 063, PB 188 064.

Development, Management and Use of Water Resources on the Public Lands. By Charles F. Wheatley, Jr., Washington, D.C., Charles E. Corker of the University of Washington, Thomas M. Stetson, San Francisco, California, and Daniel J. Reed, Los Angeles, California. Revised October 1969. Published in two volumes, Nos. PB 188 065, PB 188 066.

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